HEALTH KNOWLEDGE



HEALTH KNOWLEDGE

A THOROUGH AND CONCISE KNOWLEDGE OF THE PREVENTION, CAUSES, AND TREATMENTS OF DISEASE, SIMPLIFIED FOR HOME USE

THIRTY-FOUR DEPARTMENTS

INCLUDING

PRENATAL CARE AND THE CARE OF INFANTS, HEALTH IN CHILDHOOD, PREGNANCY AND MOTHERHOOD, WOMEN'S PHYSICAL CHANGES AND THEIR DISORDERS, DISEASES OF WOMEN, PHYSICAL CULTURE AND DEEP-BREATHING EXERCISES FOR MEN AND WOMEN, PHYSICAL CULTURE AND MASSAGE FOR INFANTS, FOODS AND THEIR VALUES, HOME NURSING, HOME REMEDIES, MEDICAL PRESCRIPTIONS IN LATIN AND ENGLISH, PLANTS, VEGETABLES, FRUITS, HERBS

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This work is the result of the best and most advanced thought and experience on the subject of medicine.

We have spared no pains or expense in collecting and arranging in popular form the best that the world has to offer. Expert opinion has been taken on every subject treated, and consultation with eminent authorities has enabled us to present a modern treatise that will commend itself to the public as thorough and scientific.

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FOREWORD

THE science of medicine would be limited by most people to that branch of knowledge which is concerned with the healing of injuries and the cure of diseases. But there is another idea of medicine, more real, more effective, less often insisted upon—an idea of medicine as the art not only of curing disease, but of preventing it; as a practice aiming not only at the recovery of health when lost, but at the discovery of the laws, and the regulating of the conditions by which actually existing health may be preserved.

No work has ever been published that has dealt so strongly and convincingly with the preventive features and actual causes, which are so very important to the layman. The editors have always borne in mind the old adage that "an ounce of prevention is worth a pound of cure."

The most important road to recovery lies in the recognition of the illness—not in the taking of dangerous drugs, but in the essential truths of hygiene and proper living conditions.

To administer patent medicines and dangerous drugs is a serious matter, especially in infancy and early childhood, as it very often lays the foundation for habit-forming drugs in adult life; hence there are none recommended in these pages, but instead, the simple home remedies and such medicines as cause or leave no dangerous after-effects. It may therefore seem reasonably certain that the patent-medicine evil will be greatly reduced by a realization of the limitation of drug action, which limitation is strongly advocated in the pages of HEALTH KNOWLEDGE.

The duty of every man is to preserve his health, not to attempt to combat diseases, The layman cannot substitute but he may anticipate the work of the doctor by healthy living and by taking precautionary measures against disease, which are at every man's command. It is the purpose of this work to provide, as far as possible, within a reasonable compass, all information the layman need possess on the subject of doctoring, and full instructions as to when he should and when he need not look for medical assistance. In the following directions, in particular, the layman needs instruction. He should have a knowledge of the incipient signs of diseases, so that they may be taken in hand promptly, that the best may be done immediately to arrest their progress, to mitigate their severity, and to preserve the patient from serious after-effects. He should be familiar with the salient signs and symptoms of poisoning, and with the expedients to take, in cases of poisoning. He should know how to give first aid to the wounded, and how to treat, on the spot, all cases of accident. He should be able to differentiate real from imaginary diseases, and be familiar with the treatment of all trifling ailments. He should know what to do in cases of serious disease until a physician can be obtained.

Special attention has been given to the prenatal care and the care of infants. The mother and nurse are given proper instructions as to the general care of the infant, such as Nursing, Artificial Feeding, Bathing, Clothing, Exercise, etc. An entire chapter on "Health in Childhood," covering sixty pages, deals with the child regarding the general care it should receive until it reaches adult life.

Every mother should have a thorough knowledge as to the care of infants and children, for on this knowledge depend the health and welfare of future generations.

The arrangement of this work has been very much simplified over former works of this character, which have been very complex, the reader seldom if ever being able to obtain therefrom the information sought, owing to the number of times these

books have been revised, new material being added in different parts of the book in an effort to keep it up to date, but thereby making the text confusing to the reader. Frequently, in perusing such books, one would find on one page the definition of a certain disease, in another part of the book would be given the causes, in another part the symptoms, in still another part the treatment, and in another the diet, etc. In most of such books the reader is referred to from three to fifteen different sections before he can obtain the desired information on the particular subject in mind.

In HEALTH KNOWLEDGE the article is started with the Definition, followed by the Causes, Symptoms, Treatment, Prevention, and finishes up with the Diet, when the treatment calls for a special diet, thus saving the reader not only annoyance but also much time, when one considers that in a case of accident the loss of one minute may mean the death of the sufferer.

Particular pains and attention have been taken in the placing of the various scientific illustrations, each one being placed in the proper position of the text to which it belongs, thus avoiding a great deal of trouble and annoyance to the reader, so often met with in poorly constructed publications. All Latin and technical terms have been discarded for the every-day phrases, with which the average man and woman are familiar.

The constructive idea, then, at the root of this work is a practical and educative one, and this explains the policy and the system upon which it has been developed. This policy concerns itself mainly with the personal maintenance of health in the individual, and within the sphere of the home.

In conclusion, we again impress upon our readers the great importance of preventive medicine over the curing of diseases, and there is no better agent employed in the prevention of diseases than deep-breathing exercises and physical culture. For the articles on this subject, we would respectfully refer our male readers to page 1074; our female readers to page 163. Exercise and massage for infants will be found on page 499.

THE MUSCLES AND THEIR DISEASES

ANATOMY.—The muscle, popularly known as "flesh," is the tissue by which, in virtue of its power of contraction, movements are made in the higher animals. Muscular tissue is divided, according to its function, into two great groups, *voluntary muscle* and *involuntary muscle,* of which the former is under control of the will, while the latter discharges its functions independently. The term "striped" muscle is often given to voluntary muscle, because under the microscope all the voluntary muscles show a striped appearance, while involuntary muscle is, in the main, "unstriped" or "plain." There are exceptions to the latter statement, for the heart muscle, which is involuntary, is partially striped, while certain muscles of the throat, and two small muscles inside the ear, not controllable by will-power, are also striped.

Structure of Muscle.—*Voluntary muscle* is disposed in a regular method over the body, being mainly attached to the skeleton, and hence often called skeletal muscle. There are certain definite muscles, and these vary as to shape only slightly in different persons, though in one person particular muscles may be developed to a much greater bulk than in others. Each muscle is inclosed in a sheath of fibrous tissue, known as fascia, or epimysium, and from this, partitions of fibrous tissue, known as perimysium, run into the substance of the muscle, dividing it into small bundles. Each of these bundles, if carefully examined, will be found to consist in turn of a collection of fibers which form the units of the muscle. Each fiber is about $\frac{1}{500}$ inch in thickness and about 1 inch long, though the dimensions vary a little in different muscles. If the fiber be cut across and examined under a high power of the microscope, it is seen to be further divided into fibrils, the cut ends of which are known as

Cohnheim's areas; but as all the fibrils of a fiber act in concert, this is a needless subdivision. Each fiber is inclosed in an elastic sheath of its own, which allows of its lengthening and shortening, and is known as the sarcolemma. Within the sarcolemma lie numerous nuclei belonging to the muscle fiber, which was originally developed from a simple cell. To the sarcolemma, at either end, is attached a minute bundle of connective-tissue fibers, which unites the muscle fiber to its neighbors, or to one of the connective-tissue partitions in the muscle, and by means of these connections the fiber produces its effect upon contracting. The sarcolemma is pierced by a nerve fiber, which breaks up upon the surface of the muscle fiber into a complicated end-plate, and by this means each muscle fiber is brought under the guidance of the central nervous system, and the discharge of energy which produces muscular contraction is controlled. When the muscle fiber within the sarcolemma is examined by a high magnifying power, it is found to show alternate light and dark transverse stripes, with a fine dotted line, called Dobie's line or Krause's membrane, across the middle of each light stripe. These appearances are due to the fact that the fiber is composed of segments made up partly of fibrous connective material and partly of semifluid contractile tissue, in which visible changes take place as the fiber contracts.

Between the muscle fibers, which have, on account of their relative length and width, a pillar-like shape, run many capillary blood-vessels. They are so placed that the contractions of the muscle fibers empty them at once of blood, and thus the active muscle is insured a specially good blood supply. None of these vessels, however, pierce the sarcolemma surrounding the fibers, so that the blood does not come into direct contact with the muscular tissue, whose nourishment is carried on by the lymph that exudes from the blood-vessels. The lymph circulation is also automatically varied, as required, by the muscular contractions. Between the muscle fibers, and enveloped in a sheath of connective tissue, lie here and there special structures known as muscle-spindles. Each of these contains thin muscle fibers, numerous nuclei, and the endings of sensory nerves. They appear to be the sensory organs of the muscles.

Involuntary muscle includes, as already stated, the heart muscle and unstriped muscle. The heart muscle stands in structure between striped and unstriped muscle. Each fiber is short, has a nucleus in its center, communicates with its neighbors by short branches, shows a faintly striped appearance near its exterior, and is devoid of sarcolemma.

Plain or unstriped muscle is found in the following positions: the inner and middle coats of the stomach and intestines; the ureters and urinary bladder; the windpipe and bronchial tubes; the ducts of glands; the gall-bladder; the uterus and Fallopian tubes; the middle coat of the blood and lymph vessels; the iris and ciliary muscle of the eye; the "dartos" tunic of the scrotum; and in association with the various glands and hairs in the skin. The fibers are very much smaller than those of striped muscle, though they vary greatly in size. Each is pointed at the ends, has one or more oval nuclei in the center, and a delicate sheath of sarcolemma enveloping it. The fibers are grouped in bundles, much as are the striped fibers, but they adhere to one another by cement material, not by the tendon bundles found in voluntary muscle.

Development of Muscle.—All the muscles of the developing individual arise from the central layer (mesoblast) of the embryo, each fiber taking origin from a single cell. Later on in life, muscles have the power both of increasing in size, as the result of use, for example, in athletes, and also of healing, after parts of them have been destroyed by injury. This takes place partly by the growth and splitting of the original fibers to form new fibers, and partly from reserve cells, known as sarcoplasts, which lie in every muscle between the muscle fibers. An example of the great extent to which unstriped muscle can develop, to meet the demands made upon its power, is given by the womb, whose muscular wall develops so much during pregnancy that the organ increases from the weight of one ounce to a weight of one and a half pounds, decreasing again to its former small size in the course of a month after childbirth.

Chemistry of Muscle.—Every muscle, as stated above, contains a great amount of fibrous tissue, but the muscular substance proper is of a semifluid nature, and can be squeezed out. It clots on standing just as blood clots, the substances formed being muscle-serum and myosine (the clot), produced from myo-

sinogen, just as fibrine forms from fibrinogen. The proportion of the different substances contained in muscles is as follows:

	PER CENT.
Water	75
Proteids (myosinogen, etc.)	18
Gelatine } Fat }	2 to 5
Extractives	0.5
Salts (chiefly potassium phosphate)	1 to 2

When a muscle is made to contract for some time the glycogen (animal starch) stored up in it becomes to an increasing extent transformed into sugar, destined probably to act as fuel to supply the energy of contraction. At the same time carbonic acid gas and sarcolactic acid are produced by this combustion, and there is a certain amount of nitrogenous waste from the wear and tear of the permanent tissues. All these waste products are removed by the lymph and blood, to be dealt with in the lungs, kidneys, and other organs of excretion.

Action of Muscle.—This involves a transformation of the chemical affinity between the substances stored up in the muscle into work and heat. The action of muscle in general is studied upon muscles removed from the bodies of frogs and similar animals immediately after death, and it is found that these may be stimulated to contract by such means as a blow, various chemical agents, application of heat, and passage of an electric current. The stimulus may be applied directly to the muscle or to the nerve supplying it, by which, as in the body, the stimulus is transmitted. A single stimulus produces a single twitch, and a series of rapidly succeeding stimuli (about ten to twelve per second) causes a single sustained contraction, which is the natural type of voluntary muscular acts. Electrical changes also take place in a muscle on contraction, the potential falling at once and the muscle being for a brief space negative to resting muscles. A still more important change accompanying contraction is the development of heat, the smallest twitch of a muscle giving quite an appreciable rise of temperature. Muscle is in this respect a very economical machine for doing work, for while a locomotive wastes about 96 per cent. of the available energy in heat, only 4 per cent. being converted into work, muscles transform 25 per cent. of their available energy into work.

Further, all the heat evolved by the acting muscles is of use in maintaining the body temperature. Heat is, however, developed in disproportionate excess when violent muscular efforts are made, and for this reason a certain amount of work is performed with more economy of muscular tissue if effected by a large number of small efforts than if effected by a few great efforts. Therefore it is less fatiguing to ascend to a height by a long gentle incline than by a steep flight of steps, though both involve about the same amount of work.

Involuntary muscle has several peculiarities of contraction. In the heart, *rhythmicality* is an important feature, one beat appearing to be, in a sense, the cause of the next beat. *Tonus* is a character of all muscle, but particularly of unstriped muscle in some localities, as in the walls of arteries. Muscles are not held either slack or taut, but in a slightly stretched condition, so that when occasion arises they are ready for instant action, while the arteries owe their elasticity and strength mainly to this fact. The involuntary muscle, forming the middle coat of the bowels, gland-ducts, and other tubes, contracts in the so-called *vermicular movement,* or peristalsis, which means that a ring of contraction passes slowly along the tube, at a rate of about one inch per second, the muscle relaxing as the ring of contraction passes on.

Fatigue of Muscle comes on when a muscle is made to act for some time. It is due, not to wearing out of the muscle's power, but to the accumulation of waste products, especially sarcolactic acid, produced by the muscle's activity. These substances affect the end plates of the nerve controlling the muscle, and so prevent destructive overaction of the muscle. As they are rapidly swept away by the blood, the muscle, after a rest, particularly if the rest be accompanied by massage or by gentle contractions to quicken the circulation, recovers rapidly from the fatigue. After great muscular activity over the whole body, a more lasting fatigue is produced by the accumulation of these products, and by their action upon the central nervous system, this being recovered from after a prolonged rest, during which the waste substances are excreted by the lungs, kidneys, and other excretory organs.

Rigor Mortis is a condition which comes on in the muscles after death, and to which the general stiffening of the body is

due. It consists in a state of permanent, wasteful contraction, beginning in the muscles of the neck and lower jaw at a period which varies from ten minutes to seven hours after death, and spreading gradually over the whole body. It comes on quickest after death from exhaustion, or from some weakening disease; and occasionally, after violent injuries causing death, it comes on instantaneously, so that the posture of the body is fixed in the attitude in which death occurs. The rigidity lasts usually from sixteen to twenty-four hours, but its duration is extremely variable, being longer, as a rule, when its onset has been slow.

Muscular System, popularly known as "the flesh," comprises all the voluntary muscles, and amounts in an average man of 154 pounds to about 62 pounds, or over two-fifths of the whole body weight. The total number of the voluntary muscles, each of which is named, amounts to about 620, including the muscles of both sides. Each muscle constitutes a separate organ, controlled by a special nerve or nerves, which connect it with the spinal cord and brain, where, however, actions and combined movements are represented rather than individual muscles. The fleshy part of the muscle is known as its "belly," and there is usually at either end a tendon, by which the muscle is "inserted" into bone or other structure, upon which it acts. One end is more fixed than the other, as a rule, the rigid end being known as the "origin" of the muscle, the more mobile end as its "insertion."

Upper limb.—*Between the trunk and limb* run the following muscles: the trapezius latissimus dorsi, large and small rhomboids, and levator of the angle of the scapula, behind; and the large and small pectoral, the subclavius and serratus magnus muscles in front. *In the shoulder region* lie the deltoid, supraspinatus, infraspinatus, large and small teres, and the subscapular muscles. *In the upper arm* the coracobrachialis, biceps, and brachialis anticus occupy the front, while the triceps and anconeus fill up the back of the arm. *In the forearm* the muscles in front that bend the wrist and fingers, or turn the hand palm downward, are the round pronator of the radius, the radial flexor of the wrist, the long palmar, the ulnar flexor of the wrist, the superficial and deep flexors of the fingers, the long flexor of the thumb, and the square pronator of the radius; while the muscles on the back of the forearm that extend the fingers and

bend the wrist backward or turn the hand palm upward, are the long supinator of the radius, longer and shorter radial extensors of the wrist, common extensor of the fingers, extensor of the little finger, ulnar extensor of the wrist, short supinator of the radius, the extensors of the metacarpal bone of the first joint and of the second joint of the thumb, and the extensor of the forefinger. *In the palm of the hand* there are four lumbrical muscles, the short palmar muscle, three muscles each for the thumb and little finger, which respectively abduct, oppose, and flex these digits, an adductor of the thumb, and, in the spaces between the metacarpal bones, seven interosseous muscles.

Lower limb.—*Muscles of the hip* are the iliopsoas in front, and, behind, the three gluteus muscles forming the prominence of the buttock, with the pyriform, external and internal obturator, two gemelli, and quadratus femoris muscles under cover of the largest gluteal muscle, while to the outer side lies the tensor of the sheath of the thigh. *On the back of the thigh* lie the biceps, semitendinosus and semimembranosus muscles, whose tendons, standing out prominently behind the knee, are known collectively as the "hamstrings." In front of the thigh are placed the sartorius, which is the longest, and the quadriceps extensor of the leg, which is the largest, muscle of the body. *On the inner side of the thigh* lie the gracilis and pectineus muscles, with the long, the short, and the large adductors. *On the front of the leg* are placed the tibialis anticus, the special extensor of the great toe, the long extensor of the toes, and the peroneus tertius muscles. *On the outer side of the leg* are two muscles, the long and short peroneal muscles, whose tendons pass down behind the outer ankle to the foot. *On the back of the leg* are two groups of muscles. The superficial group of three muscles, consisting of the gastrocnemius, a double-bellied muscle, and the soleus, which is flat and projects slightly beneath the gastrocnemius, together with the small plantaris muscle, forms the calf of the leg, and ends in the "tendo Achillis" behind the heel. The deep group lies close upon the bones, and consists of the popliteus, long flexor of the toes, long flexor of the great toe, and tibialis posticus muscles, the tendons of the last three passing down behind the inner ankle. *In the foot* there is one muscle, the short extensor of the toes, upon the "dorsum," or upper surface; while in the sole of the foot are four layers of

small muscles, comprising the short flexor of the toes, and abductors of the great and little toes; the accessory flexor of the toes, and four lumbrical muscles; the short flexor of the great toe, oblique and transverse adductors of the great toe, and short flexor of the little toe; and in the fourth layer seven interosseous muscles, as in the hand.

Face and head.—Attached to the auricle of the ear are three muscles of feeble power, which raise, draw back and flatten the auricle. The eyelids, nose, and lips are provided with numerous flattened muscles, which dilate and draw together these openings, and which form the means by which varying facial expression is brought about. The actions of these muscles have been exhaustively studied and treated by Sir Charles Bell in his "Anatomy and Philosophy of Expression," and by Charles Darwin in his "Expression of the Emotions in Man and Animals." The movements of the eyeball are effected by six small muscles. The movements of the lower jaw in chewing are controlled by four muscles on each side: the masseter muscle, which can be felt on the hinder part of the cheek as the jaws are closed; the temporal muscle, felt in the region of the temple; and the outer and inner pterygoid muscles, attached to the deep surface of the jaw-bone. Within the mouth, the tongue consists of certain intrinsic muscle bundles, together with four muscles on each side, which connect it with the lower jaw, hyoid bone, and base of the skull. The floor of the mouth is formed by four muscles, which pass from the hyoid bone in front of the neck up to the lower jaw and base of the skull. The throat, or pharynx, which is open in front to the nose, the mouth, and the larynx one beneath the other, is closed behind by three broad, flat muscles, the superior, middle, and inferior constrictors of the pharynx, and is swung from the base of the skull by the stylo-pharyngeus muscle on either side. The soft palate, which separates the hinder part of the cavities of nose and mouth from one another, consists of five muscles on each side covered by mucous membrane. The larynx is controlled by eleven small muscles, which open or close its opening, and render the vocal cords more or less tense in the production of the voice.

Front of neck.—The most prominent feature of the neck is the thick sterno-mastoid muscle, which on each side runs

WINDPIPE
MUSCLE OF NECK
COLLAR-BONE
TENDON OF BICEP
MUSCLE OF SHOULDER
SMALL MUSCLE OF BREAST
LARGE MUSCLE OF BREAST
BICEP MUSCLE
FLEXOR MUSCLE
ABDOMINAL WALLS
LINEA ALBA
EXTERNAL MUSCLE OF ABDOMEN
INTERNAL MUSCLE OF ABDOMEN
RECTOR FEMORES
PECTINEUS
ABDUCTOR LONGUS
PECTINEUS
ABDUCTOR LONGUS
TAILOR MUSCLE

from behind the ear downward and forward to the breast-bone and collar-bone. Partly under cover of these and protecting the front of the larynx are four small muscles, the sterno-hyoid, sterno-thyroid, thyro-hyoid, and omo-hyoid muscles on each side. Deep in the neck, behind, and to either side of the windpipe, gullet, and large blood-vessels, lie the anterior, middle, and posterior scalene muscles, which pass from the spinal column to the upper two ribs. Lying close upon the spine are three rectus muscles on each side, which bend the head upon the spine, and the long muscle of the neck, which bends the spine in this region.

Back of the neck and trunk.—The muscles in this region form a very complicated system, most arising from the spines or transverse processes of several vertebræ or from a number of ribs, and running upward to be attached to another series of vertebræ or ribs some distance above, while the upper muscles of the set are attached to the hinder portion of the skull. These muscles form a couple of strong columns running the whole length of the back from the loins to the head, with a groove between, in which the line of vertebral spines can be felt. The upper and lower serrated muscles of the back are muscles of respiration passing from ribs to spine, and, together with the splenius muscle in the neck, form a superficial layer. Beneath them the erector spinæ, the great muscle which supports the back, runs the whole distance from the sacrum to the skull, obtaining at numerous points attachments to the spines and transverse processes of the vertebræ and to the neighboring portions of the ribs. This muscle, along with those about to be mentioned, is of great power, having, even in moderately strong persons, a lifting power of 200 to 400 pounds. Covered by the erector are the complexus and transverso-spinales group of muscles, in which all the muscles ascend with an inward inclination; a series of short muscles connecting succeeding vertebræ with one another; and four small muscles passing from the uppermost two vertebræ to the skull. These last-named muscles incline and rotate the trunk and head from side to side.

Chest.—The diaphragm is the chief muscle of this part of the body. Next in importance come the outer and inner intercostal muscles, which form a double layer of oblique fibers filling up the gaps between the ribs, the fibers of the two muscles

running in different directions. There are also levators of the ribs, which pass each from a vertebra to the rib beneath it; subcostal muscles, and the triangularis sterni muscle. All these muscles share in the act of inspiration.

Abdomen.—The sides and front of the abdomen, unprotected by any bone beneath the level of the ribs, are inclosed by thick muscular layers strengthened by sheets of fibrous tissue. On the sides of the abdomen are three muscles: the external oblique, consisting of fibers which run downward and forward from the lower eight ribs; the internal oblique, under cover of the first, consisting of fibers which run upward and forward from the hip-bone, and fibrous layers in its neighborhood; and the transversalis muscle, of which the fibers run horizontally forward from the lower six ribs, the lumbar vertebræ, and the hip-bone. The fibers of all three muscles end along a curved line, the semilunar line, which is plainly visible upon the surface of the abdomen, running with a curve from its upper to its lower end, and situated, at the level of the navel, some four or five inches from the middle line. From this line a strong sheet of dense fibrous tissue runs inward, those of the two sides meeting down the middle line of the body. Embedded in this fibrous sheet is a strong muscle upon each side, the rectus abdominis, which is three or four inches broad, almost an inch thick in muscular persons, and runs vertically from the front of the pelvis up to the lower part of the chest. It is a muscle of great strength, and is divided into four or five sections, by tendinous intervals, which run across the muscle, and which, in well developed persons, form distinct transverse depressions on the front of the abdomen. The quadratus lumborum is situated behind, in the gap between the last rib and the hip-bone. Other small muscles close the lower opening of the pelvis, and are associated with the functions of the bowel and genital organs.

Respiration.—The muscles of respiration comprise the external and internal intercostal muscles, with three sets of less important muscles. Each of the *external intercostal* muscles arises from the lower border of a rib, and, going downward and forward, is inserted in the outer edge of the upper border of the rib immediately below, extending in the space between the ribs from the transverse process of the vertebræ behind almost to the costal cartilages in front. Each of the *internal intercostal*

muscles arises from the costal cartilage and from the inner part of the groove on the under surface of a rib, and, going downward and backward, is inserted on the inner edge of the upper border of the costal cartilage and the rib below, extending from the border of the sternum in front to the angle of the rib behind. The *levatores costarum* arise from the transverse processes of the last cervical and all but the last dorsal vertebræ and, proceeding downward and outward, are inserted on the outer aspect of the corresponding ribs, behind the angles. The *infracostales* are muscular slips situated on the inner aspect of the lower ribs behind their angles, each of them arising from the inner edge of the under surface of a rib, and, passing over one or two ribs, is inserted on the upper border of a rib below. The *triangularis sterni* arises from the back of the ensiform cartilage and the sternum, and, spreading outward, upward, and on each side, is inserted on the costal cartilages of the second, third, fourth, fifth, and sixth ribs. The *diaphragm* is the dome-shaped muscular partition which divides the cavity of the chest from the cavity of the abdomen, and it arises, in front, from the back of the lower end of the breast-bone at the sides, by muscular slips from the cartilages of the lower six ribs; behind, by the right and left crura, fibro-muscular slips arising from the front of the lumbar vertebræ, and crossing one another in front of the aorta. From all the above origins muscular fibers converge toward the center of the body and are inserted in a large central tendon of trefoil shape. There are three openings in the diaphragm: the first has the aorta, vena azygos major, and thoracic duct passing through it, the second in the right part of the central tendon, the inferior vena cava passing through it, and the third practically in the middle line, behind the central tendon, the gullet and both vagus nerves passing through it.

In breathing the movement of inspiration is carried out by the diaphragm becoming flatter, the central tendon being pulled downward and so increasing the capacity of the chest cavity, while at the same time it raises the ribs, thus increasing the transverse diameter of the thorax; the *intercostal* muscles also assist in raising the ribs, while in a deep, forced inspiration the superficial and deep muscles of the back, the muscles of the chest, and the group of muscles between the root of the neck and the hyoid bone are brought into play.

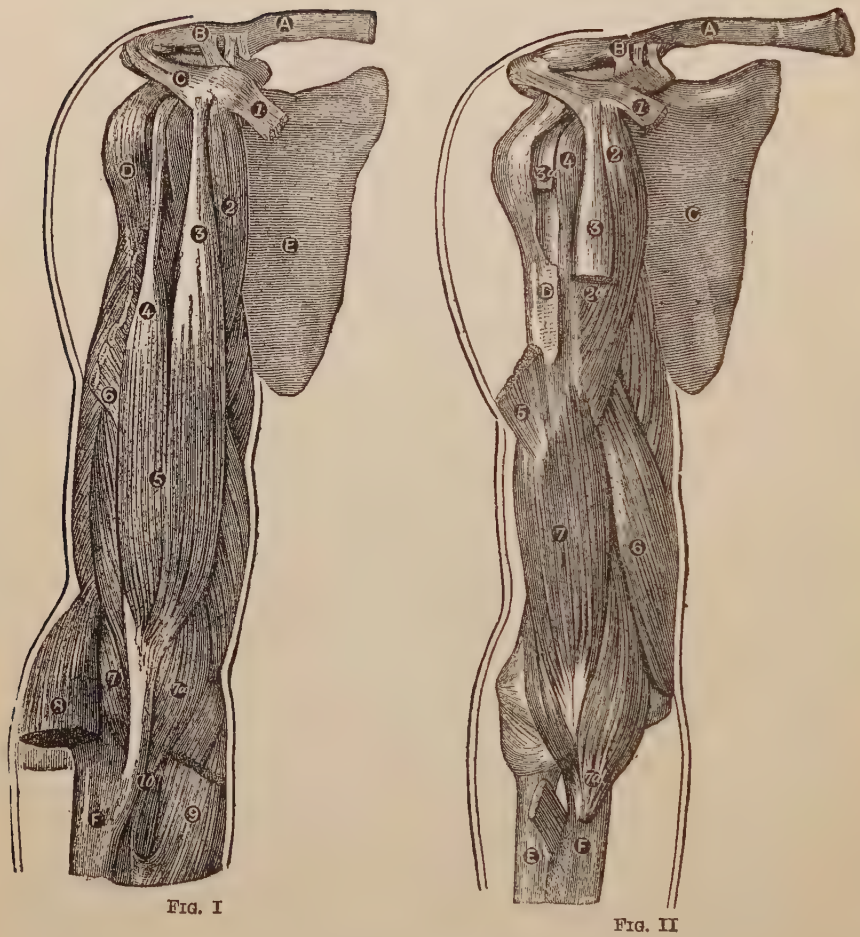


FIG. I FIG. II

PLATE I—UPPER ARM

PLATE I—UPPER ARM

FIG. I

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Clavicle.	A. Collar-bone.
B. Acromial end of clavicle.	B. Outer edge of collar-bone.
C. Coraco-acromial ligament.	C. Ligament joining arm to collar-bone.
D. Greater tuberosity of humerus.	D. Head of upper bone of the arm.
E. Scapula.	E. Shoulder-blade.
F. Radius.	F. One of the bones of the forearm.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Tendon of pectoralis minor, cut.	1. Cut end of chest muscle.
2. Coracobrachialis.	2. Raises arm up.
3. Short head of biceps.	3, 4, 5. Raise forearm up.
4. Long head of biceps.	
5. Body of biceps.	
6. Tendon of deltoid, cut.	6. Rotates arm outward.
7, 7*a*. Brachialis anticus.	7, 7*a*. Rotates only the forearm.
8. Supinator radii longus, cut.	8. Rotates forearm outward.
9. Flexor profundus digitorum.	9. Raises the forearm.
10. Insertion of brachialis anticus.	10. Bends the elbow.

FIG. II

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Clavicle.	A. Collar-bone.
B. Coraco-clavicular ligament.	B. Ligament joining collar-bone to shoulder.
C. Scapula.	C. Shoulder-blade.
D. Shaft of humerus.	D. Long bone of arm.
E. Radius.	E, F. Bones of forearm.
F. Ulna.	

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Tendon of pectoralis minor.	1. Cut end of chest muscle.
2. Coracobrachialis.	2, 2*a*. Raise arm up.
2*a*. Insertion of coracobrachialis.	
3. Short tendon of biceps, cut.	3. Raises forearm up.
3*a*. Long tendon of biceps, cut.	3*a*. Branch of Muscle No. 3.
4. Subscapularis.	4. Pulls arm backward.
5. Tendon of deltoid, cut.	5. Raises arm over the chest.
6. Internal head of triceps.	6. Pulls arm backward.
7. Brachialis anticus.	7. Raises forearm.
7*a*. Insertion of brachialis anticus.	7*a*. Tendon of Muscle No. 7.



FIG. I FIG. II

PLATE II—FOREARM AND HAND, BACK AND SIDE VIEWS

PLATE II—FOREARM AND HAND, BACK AND SIDE VIEWS

Fig. I

ANATOMICAL NAME	USE OF MUSCLE
1, 2. Brachialis anticus.	1, 2. Raises the forearm.
3. Origin of (4) extensor carpi radialis brevior.	3, 4. Extends the forearm.
5. Supinator brevis.	5. Rotates the forearm.
6. Extensor ossis metacarpi pollicis.	6. Closes the fingers.
7. Extensor primi internodii pollicis.	7, 8. Extend the thumb out.
8. Extensor secundi internodii pollicis.	
9. Extensor indicis.	9. Extends the index-finger.
10. Flexor carpi ulnaris.	10, 11. Rotate the hand.
11. Origin of Muscle No. 10.	
12. Flexor digitorum profundus (ulnar origin).	12. Closes the fingers.
13, 14. Abductor indicis, or first dorsal interosseous muscle.	13, 14. Pulls index-finger to the thumb.
15, 16. 17, 19. 18, 20. Dorsal interosseous muscles.	15, 16. 17, 19. 18, 20. Move the fingers.

Fig. II

ANATOMICAL NAME	USE OF MUSCLE
1. Biceps.	1, 2. Bend the elbow.
2. Brachialis anticus.	
3. Supinator radii longus.	3. Rotates the forearm.
4. Triceps.	4. Straightens out the arm.
5. Brachialis anticus.	5. Bends the elbow.
6. Extensor carpi radialis longior.	6. Straightens out the finger and bends wrist backward.
7. Extensor carpi radialis brevior.	7, 8, 9, 10. Similar to Muscle No. 6.
8. Extensor communis digitorum.	
9. Extensor proprius minimi digiti.	
10. Extensor carpi ulnaris.	
11. Anconeus.	11, 12. Rotate the forearm.
12. Pronator radii teres.	
13. Flexor carpi radialis.	13. Bends the fingers.
14. Extensor ossis metacarpi pollicis.	14, 15, 16. Draw back the thumb.
15. Extensor primi internodii pollicis.	
16. Extensor secundi internodii pollicis.	
17. Tendon of extensor indicis or indicator.	17. Pulls out the index-finger.
18. Opponeus pollicis.	18. Draws the thumb sideward.
19. Abductor indicis, or first dorsal interosseus.	19. Draws index-finger to thumb.

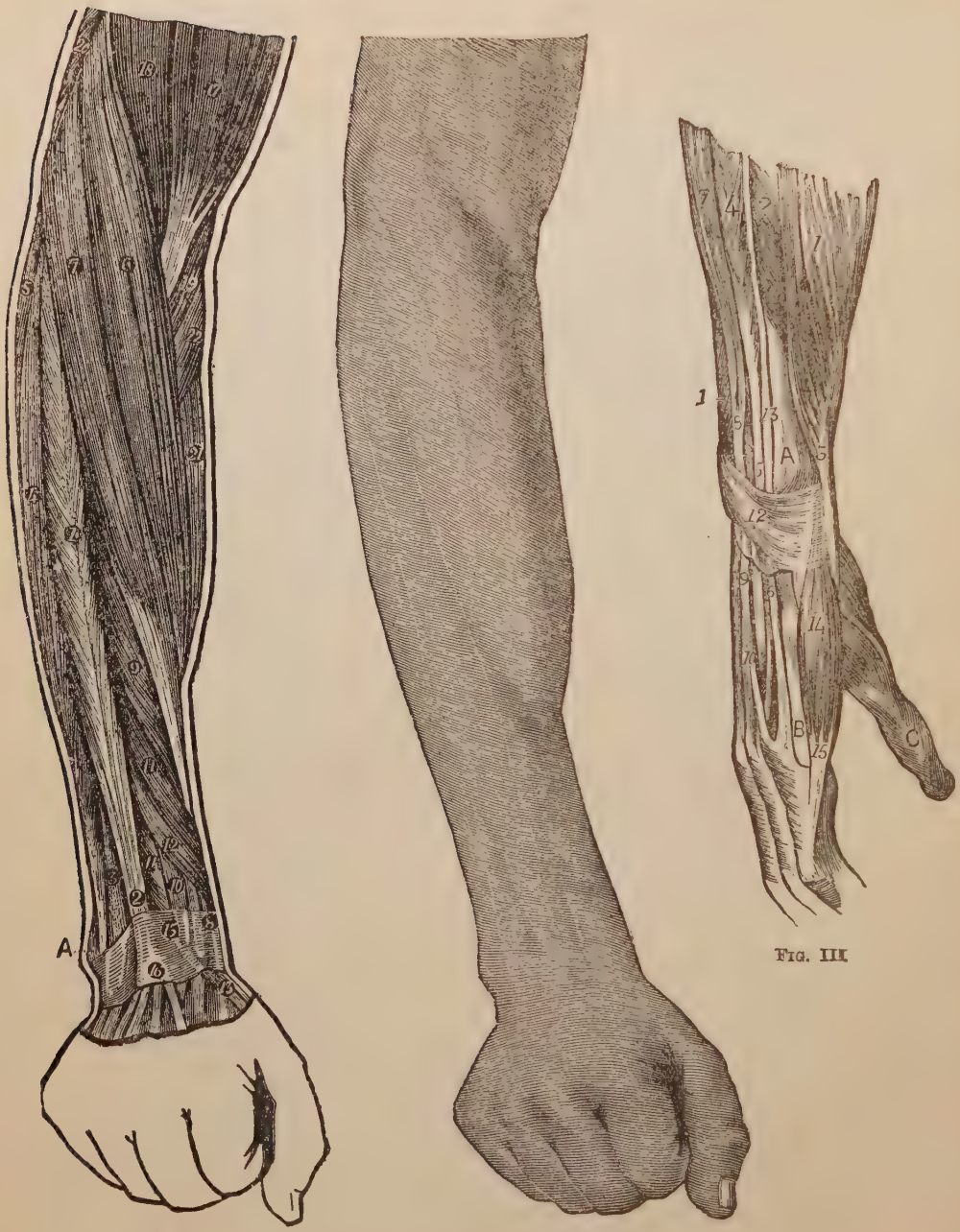


Fig. II

Fig. I

Fig. III

PLATE III—FOREARM AND HAND

PLATE III—FOREARM AND HAND

FIG. I. A study, from life, of the outer surface of the arm

FIG. II

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Ulna.	A. Bone of the forearm.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Extensor communis digitorum.	1, 2. Open up the hand.
2. Tendon of the above about to divide to the fingers.	
3. Extensor proprius minimi digiti.	3. Pulls small finger backward.
4. Extensor carpi ulnaris.	4. Pulls the ring finger backward.
5. Anconeus.	5. Surrounds the elbow-joint.
6. Supinator longus.	6. Rotates the forearm.
7. Extensor carpi radialis longior.	7, 8. Pull thumb outward.
8. Its tendon.	
9. Extensor carpi radialis brevior.	9, 10. Pull thumb backward.
10. Its tendon.	
11. Abductor pollicis longus.	11, 12. Extend the thumb.
12. Abductor pollicis brevis.	
13. Tendon of extensor longus pollicis.	13. Pulls thumb backward.
14. Extensor longus pollicis.	14, 15. Pull thumb sideward.
15. Its tendon passing under the annular ligament.	
16. The annular ligament.	16. Fibrous band around the wrist.
17. Biceps.	17. Raises the forearm.
18. Brachialis anticus.	18, 19. Rotate the forearm.
19. Brachialis anticus, internal portion.	
20. Triceps.	20. Raises the elbow up.
21. Flexor carpi radialis.	21. Closes the fingers.
22. Pronator teres.	22. Rotates the forearm.

FIG. III

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Ulna.	A. Bone of the forearm.
B. Fifth metacarpal bone.	B. Head of the finger-bone.
C. Thumb.	C. Thumb.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Flexor carpi ulnaris.	1, 2, 3. Close the hand.
2. Fibers of flexor digitorum profundus.	
3. Tendon of flexor carpi ulnaris.	
4. Extensor carpi ulnaris.	4, 5. Pull index-finger backward.
5. Its tendon.	
6. Tendon of extensor minimi digiti.	6. Extends the index-finger.
7. Extensor communis digitorum.	7, 8, 9, 10. Pull all the fingers backward.
8. Its tendon passing behind the annular ligament.	
9. The same tendon dividing to pass to the phalanges.	
10. Similar to above.	
11. Muscles of the thumb.	11. Muscles of the thumb.
12. Annular ligament.	12. Fibrous band around the wrist.
13. Extensor minimi digiti.	13. Extends the middle finger.
14. Abductor minimi digiti.	14, 15. Close the middle finger.
15. Its tendinous attachment.	



FIG. III

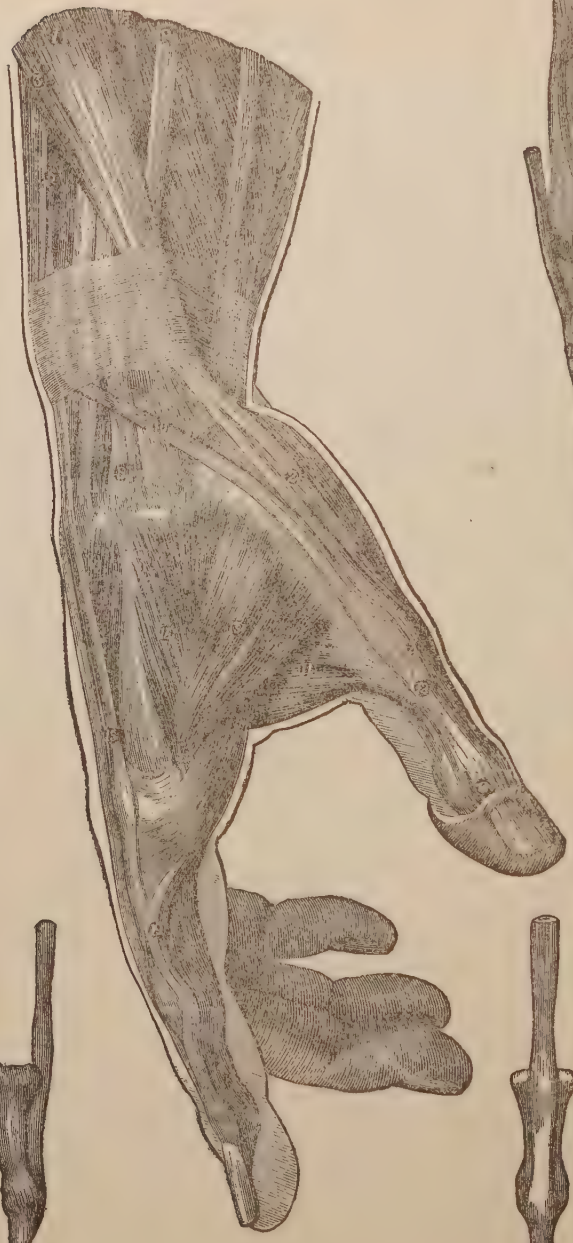


FIG. I



FIG. II



FIG. VI

FIG. VII

FIG. V



FIG. IV

PLATE IV—WRIST AND HAND

PLATE IV—WRIST AND HAND

FIGS. I AND II

ANATOMICAL NAME	USE OF MUSCLE
1. Extensor ossis metacarpi pollicis.	1. Bends the thumb backward and to side.
2. Its tendinous insertion.	2. Similar to above.
3. Extensor primi internodii pollicis.	3, 4. Turn the thumb sideward.
4. Its insertion.	
5. Extensor secundi internodii pollicis.	5, 6. Bend the thumb backward.
6. Its tendinous insertion.	
7. Extensor carpi radialis longior.	7, 8. Bend the index-finger backward.
8. Its insertion.	
9. Tendon of supinator radii longus.	9. Rotates the hand.
10. Tendon of extensor secundi internodii pollicis.	10. Pulls the thumb backward.
11. Adductor pollicis.	11, 12. Bring thumb next to index-finger.
12. Tendinous expansion of above, spreading into the tendon or the long extensor of the thumb.	
13, 14. First dorsal interosseous or abductor indicis.	13, 14. Move index-finger sideward.
15. Extensor indicis.	15. Extends the index-finger.
16. Dorsal interosseous.	16, 17, 18, 19. Move the fingers sideward.
17. Lumbrical muscle.	
18, 19. Their insertions.	

FIG. III. Shows the ends of the muscles going to the fingers and their mode of attachment.

FIG. IV. Top view of bones of a finger.

FIG. V. View of deep tendons going to the fingers.

FIGS. VI AND VII. The same tendons seen on side view.



Fig. II

Fig. I

PLATE V—HAND, BACK AND FRONT

PLATE V—HAND, BACK AND FRONT

FIG. I

ANATOMICAL NAME	USE OF MUSCLE
1. Insertion of extensor carpi radialis longior.	1, 2. Extend the middle and index fingers.
2. Insertion of extensor carpi radialis brevior.	
3. Extensor indicis.	3. Extends the index-finger.
4, 5. First dorsal interosseous.	4, 5. Move index-fingers toward the thumb.
6. Second dorsal interosseous.	6, 7, 8. Keep the fingers together.
7. Third dorsal interosseous.	
8. Fourth dorsal interosseous.	
9. Abductor minimi digiti.	9. Draws the little finger sideward.
10. Tendon of extensor minimi digiti.	10. Extends the little finger.
11. Extensor carpi ulnaris.	11. Rotates the wrist.
12. Tendon of extensor ossis metacarpi pollicis.	12, 13. Move thumb away from fingers.
13. Tendon of extensor primi internodii pollicis.	

FIG. II

ANATOMICAL NAME	USE OF MUSCLE
1, 2. Abductor pollicis, cut.	1, 2. Draw thumb sideward.
3. Opponens pollicis.	3, 4. Move thumb backward.
4. Flexor brevis pollicis.	
5. Adductor pollicis.	5. Draws thumb to index-finger.
6. Abductor minimi digiti.	6. Draws little finger to side.
7. Flexor brevis minimi digiti.	7. Bends the little finger.
8, 9. Cut tendons of flexor sublimis digitorum.	8, 9. Bend the small fingers.
10. Tendons of flexor profundus digitorum.	10. Similar to Muscle 8 and 9.
11, 12. Lumbricales.	11, 12. Move fingers sideward.
13. Tendon of extensor ossis metacarpi pollicis.	13. Extends the thumb.
14. Tendon of flexor carpi radialis.	14. Bends the wrist.
15. Tendon of flexor digitorum sublimis.	15. Bends the small fingers.
16. Pronator quadratus.	16. Rotates the forearm.
17. Tendon of flexor longus pollicis.	17. Bends the thumb.
18. Flexor digitorum profundus.	18. Bends the small fingers.



FIG. I FIG. II

PLATE VI—THIGH, BACK AND FRONT

PLATE VI—THIGH, BACK AND FRONT

FIG. I

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Crest of ilium.	A. Edge of hip-bone.
B. Patella.	B. Knee-cap.
C. Tibia.	C, D. Bones of the leg.
D. Head of fibula.	

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Obliquus abdominis externus.	1, 2. Muscles of abdominal wall.
2. Aponeurosis of obliquus abdominis externus.	
3. Sartorius.	3, 4, 5. Rotate leg outward.
4. Origin of sartorius.	
5. Its insertion.	
6. Rectus femoris.	6, 7, 8, 9. Raise the thigh.
7. Head of rectus as it disappears.	
8. Its tendon.	
9. Its insertion.	
10. Ligamentum patellæ.	10. Ligament of the knee-cap.
11. Tensor vaginæ femoris.	11, 12, 13. Rotate leg in.
12. Its origin.	
13. Its insertion.	
14. Psoas and iliacus.	14. Raises the thigh.
15. Pectineus.	15. Rotates the thigh inward.
16. Adductor longus.	16. Pulls the leg inward.
17. Adductor magnus.	17. Raises the thigh.
18. Gracilis.	18. Pulls the leg inward.
19. Vastus externus.	19. Extends leg sideward.
20. Vastus internus.	20, 21. Bring leg inward.
21. Its insertion.	
22. Tibialis anticus.	22. Raises the foot.
23. Peroneus longus.	23. Rotates the foot.
24. Soleus.	24, 25. Raise the heel.
25. Gastrocnemius.	
26. Capsular ligament of knee.	26. Capsule of knee-joint.

FIG. II

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Great trochanter.	A. Head of the thigh-bone.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Obliquus abdominis externus.	1. Muscle of abdominal wall.
2. Fascia over gluteal region.	2. Fascia over the buttocks.
3. Gluteus maximus.	3, 4, 5, 6, 7. Raise leg backward.
4. Its origin at crest of ilium.	
5. Its sacral origin.	
6. Its fascial attachments.	
7. Its insertion into great trochanter.	
8. Vastus externus.	8. Rotates leg out.
9. Biceps femoris.	9, 10, 11. Raise leg backward.
10. Short head of biceps.	
11. Its tendon.	
12. Semitendinosus.	12, 13. Raise leg up and inward.
13. Semimembranosus.	
14. Gracilis.	14. Pulls leg sideward.
15. Sartorius.	15. Rotates leg outward.
16. Adductor magnus.	16. Raises the thigh.
17, 18. Gastrocnemius.	17, 18. Raise the heel backward.
19. Expansion of the tendinous origin of gastrocnemius forming a covering for the fleshy fibers.	19. Similar to Muscles 17 and 18.

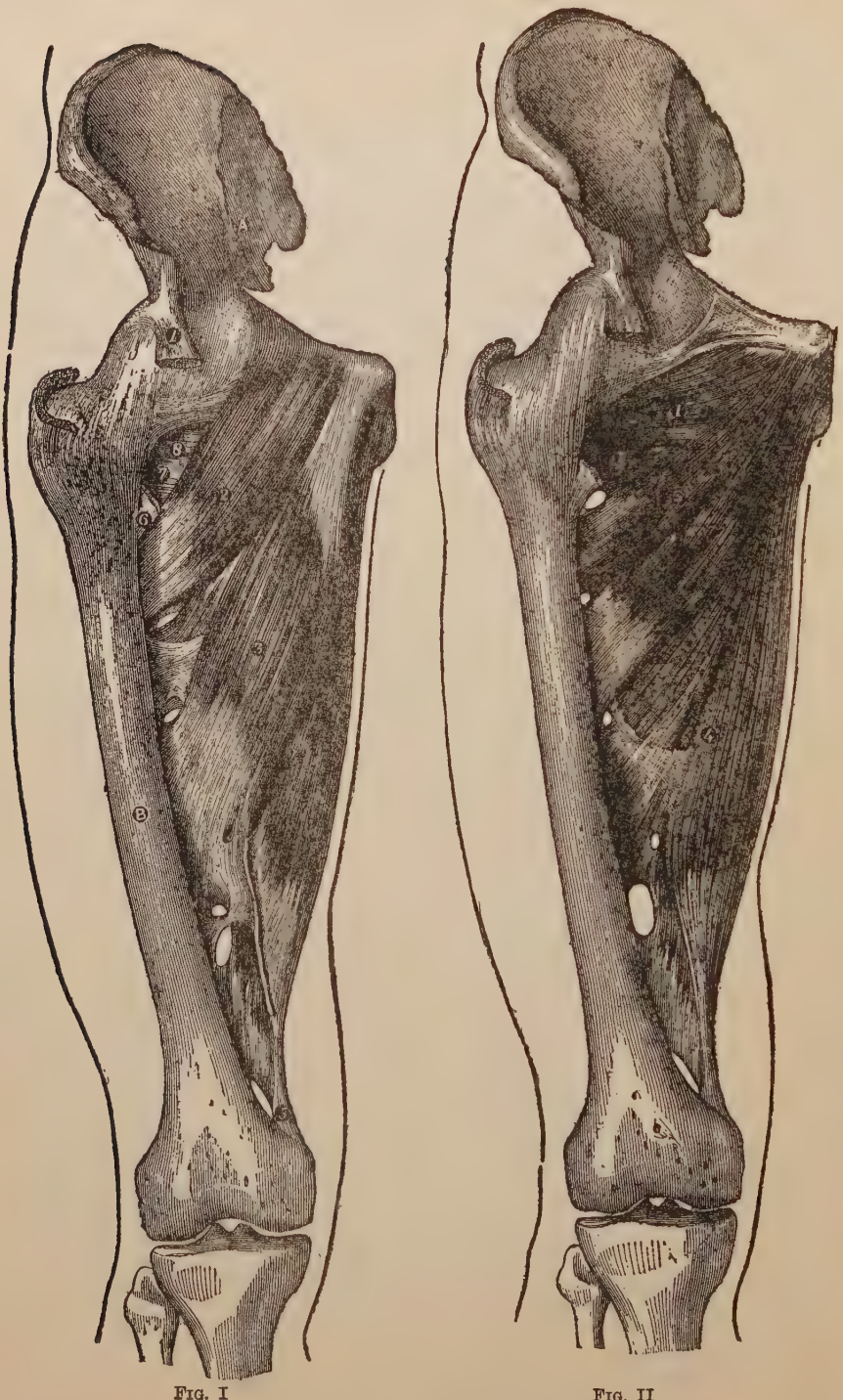


FIG. I FIG. II

PLATE VII—THIGH, DEEP LAYER

PLATE VII—THIGH, DEEP LAYER

Fig. I

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Ilium.	A. Hip-bone.
B. Femur.	B. Long bone of the thigh.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Cut tendon of rectus femoris.	1. Pulls thigh backward.
2. Pectineus.	2. Rotates thigh inward.
3. Adductor longus.	3. Pulls thigh up and turns it round.
4. Adductor magnus.	4, 5. Raise the thigh.
5. Its lower insertion.	
6. Cut tendon of psoas.	6, 7, 8. Pull the leg inward.
7. Quadratus femoris.	
8. Obturator externus.	

Fig. II

ANATOMICAL NAME	USE OF MUSCLE
1. Obturator externus.	1, 2. Pull the leg inward.
2. Quadratus femoris.	
3. Adductor brevis.	3, 4. Draw the leg up and inward.
4. Adductor magnus.	



FIG. I FIG. II

PLATE VIII—THIGH, OUTSIDE AND INSIDE VIEWS

PLATE VIII—THIGH, OUTSIDE AND INSIDE VIEWS

FIG. I

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Great trochanter.	A. Head of the long bone of the thigh.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Obliquus abdominis externus.	1. Muscle of the abdominal wall.
2. Gluteus maximus.	2. Pulls the thigh backward.
3, 4. Its insertion into femur.	3, 4. Similar to Muscle 2.
5. Its insertion into trochanter.	5. Similar to Muscles 2, 3, and 4.
6. Gluteus medius.	6. Rotates the thigh inward.
7. Fascia which covers the buttock.	7. Fascia over the buttock.
8. Tensor vaginæ femoris.	8, 9, 10. Rotate the thigh inward.
9. Its origin.	
10. Its insertion into fascia lata.	
11. Sartorius.	11. Rotates the leg outward.
12. Vastus externus.	12. Extends leg sideward.
13. Rectus femoris.	13. Bends the knee.
14. Vastus internus.	14. Brings leg inward.
15. Tendon of quadriceps.	15, 16. Rotate the knee.
16. Cut end of fascia lata.	
17. Biceps.	17. Raises the knee.
18. Short head of biceps.	18, 19. Rotate the knee.
19. Its tendon.	
20. Semimembranosus.	20. Bends the knee.
21. Soleus.	21. Raises the heel.
22. Tibialis anticus.	22. Raises the foot.

FIG. II

ANATOMICAL NAME	USE OF MUSCLE
1. Iliacus.	1, 2. Raise the thigh.
2. Psoas.	
3. Rectus femoris.	3. Raises the knee.
4. Sartorius.	4, 5. Rotate the knee outward.
5. Insertion of sartorius.	
6. Vastus internus.	6, 7. Rotate the knee inward.
7. Its attachment into patella.	
8. Adductor longus.	8. Pulls the leg inward.
9. Gracilis.	9. Raises the knee.
10. Adductor magnus.	10. Draws the thigh inward.
11. Semimembranosus.	11, 12. Bend the knee.
12. Semitendinosus.	
13. Outer head of gastrocnemius.	13. Raises the heel.
14. Gluteus maximus.	14. Rotates leg outward.
15. Obturator internus.	15, 16. Support the pelvis.
16. Its tendon leaving pelvis.	
17. Pyriformis.	17. Holds thigh in position.



FIG. I FIG. II

PLATE IX—LEG AND FOOT

PLATE IX—LEG AND FOOT

FIG. I

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Patella.	A. Knee-cap.
B. Tibia.	B. Bone of the leg.
C. Annular ligament.	C. Ligament of the ankle.
D. External malleolus.	D. Outer bone of ankle.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Vastus externus.	1, 2. Raise the knee up.
2. Vastus internus.	
3. Tibialis anticus.	3. Rotates foot outward.
4. Extensor longus digitorum pedis.	4. Extends the toes.
5. Peroneus longus.	5. Turns foot in.
6. Soleus.	6. Raises the heel.
7. Extensor proprius pollicis.	7. Extends the big toe.
8. Peroneus tertius.	8, 9. Raise outside of the foot.
9. Its tendon.	
10. Tendon of tibialis anticus.	10. Raises inner side of foot.

FIG. II

BONES

Same as FIG. I

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Cut portion of vastus externus.	1, 2. Raise the knee-cap.
2. Vastus internus.	
3. Biceps femoris.	3. Pulls the knee out.
4. Cut head of peroneus longus.	4. Turns foot inward.
5. Cut portion of tibialis anticus.	5, 5*a*. Raise foot.
5*a*. Tendon of same.	
6. Extensor longus digitorum.	6. Extends the toes.
7. Extensor proprius pollicis.	7. Extends the big toe.
8. Soleus.	8. Raises the heel.
9. Peroneus brevis.	9, 10. Raise outside of foot.
10. Peroneus tertius.	
11. Extensor brevis digitorum.	11. Raises the toes.
12. Tendon of peroneus tertius.	12. Raises outside of foot.
13. Tendon of extensor proprius pollicis pedis.	13. Raises the large toe.



FIG. I



FIG. III

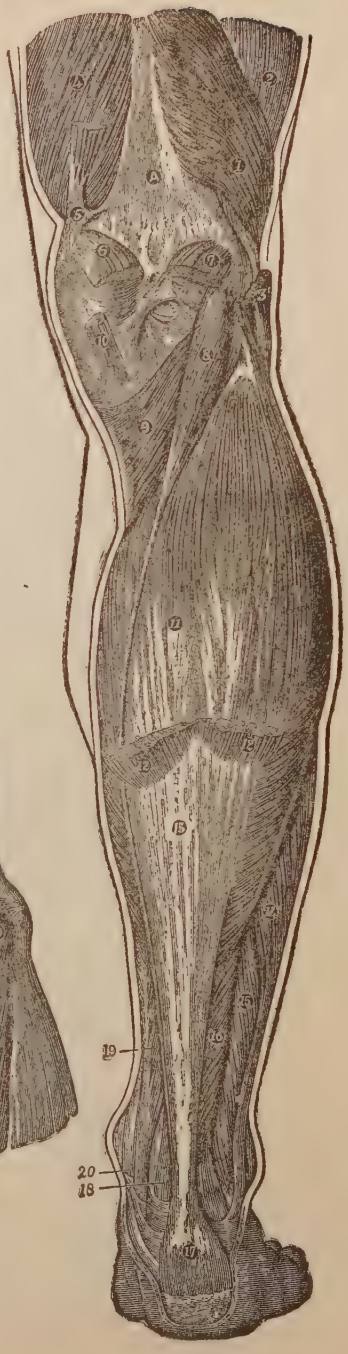


FIG. II

PLATE X—LEG, BACK VIEW

PLATE X—LEG, BACK VIEW

FIG. I

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Back of femur—same in all three diagrams.	A. Back view of the long bone of the thigh—same in all three diagrams.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Biceps femoris.	1. Rotates leg inward.
2. Semimembranosus.	2, 3, 4. Rotate the thigh.
3. Semitendinosus.	
4. Tendinous edge of semimembranosus.	
5. Gracilis.	5. Bends the knee.
6. Sartorius.	6. Rotates the knee.
7. Inner head of gastrocnemius.	7. Raises the heel.
8. Plantaris.	8. Bends the knee.
9. Outer head of gastrocnemius.	9. Raises the heel.
10, 11. Insertion of the two portions of gastrocnemius into the tendo Achillis.	10, 11. Similar to Muscle No. 9.

FIG. II

ANATOMICAL NAME	USE OF MUSCLE
1. Posterior inferior origin of vastus externus.	1, 2. Rotate the knee.
2. Vastus externus.	
3. Cut tendon of biceps femoris.	3. Bends the knee.
4. Vastus internus.	4, 5. Draw the leg inward.
5. Cut tendon of adductor magnus.	
6. Cut inner head of gastrocnemius.	6, 7. Raise the heel.
7. Cut outer head of gastrocnemius.	
8. Plantaris.	8. Bends the knee.
9. Popliteus.	9. Rotates the knee.
10. Tendon of semimembranosus.	10. Bends the knee.
11. Soleus.	11, 12, 13. Raise the heel.
12. Cut portions of gastrocnemius.	
13. Tendo Achillis.	
14. Peroneus longus.	14, 15. Raise outer side of foot.
15. Peroneus brevis.	
16. Fleshy part of flexor longus pollicis.	16. Bends the big toe.
17. Insertion of tendo Achillis.	17. Ligament covering the heel.
18. Flexor longus pollicis.	18. Bends the big toe.
19. Flexor longus digitorum.	19. Bends small toes.
20. Tibialis posticus.	20. Extends the foot.

FIG. III

ANATOMICAL NAME	USE OF MUSCLE
7. Inner head of gastrocnemius.	7. Raises the heel.
8. Plantaris.	8. Bends the knee.
9. Outer head of gastrocnemius.	9. Raises heel and bends the knee.
10, 11. Fleshy margins of gastrocnemius.	10,11. Similar to Muscle No. 9.



FIG. I FIG. II

PLATE XI—LEG AND FOOT, OUTSIDE AND INSIDE

PLATE XI—LEG AND FOOT, OUTSIDE AND INSIDE

FIG. I

ANATOMICAL NAME	USE OF MUSCLE
1. Vastus internus.	1. Bends the knee-joint.
2. Sartorius.	2. Rotates leg inward.
3. Semimembranosus.	3. Bends the knee-joint.
4. Inner head of gastrocnemius.	4, 5, 6. Raise the heel.
5. Body of above.	
6. Tendo Achillis.	
7. Soleus.	7. Aids in raising the heel.
8. Flexor longus digitorum pedis.	8. Bends all toes except big toe.
9. Flexor longus pollicis.	9. Bends the big toe.
10. Tendon of tibialis posticus.	10. Moves ankle backward.
11. Tibialis anticus.	11, 12. Raise inner side of foot.
12. Tendon of above.	
13. Abductor pollicis.	13. Pulls big toe outward.

FIG. II

ANATOMICAL NAME	USE OF MUSCLE
1. Rectus femoris.	1. Rotates leg outward.
2. Vastus externus.	2. Bends the knee-joint.
3. Cut portion of fascia lata.	3. Pulls leg outward.
4. Ligamentum patellæ.	4. Ligament of knee-joint.
5. Biceps femoris.	5, 6. Bend the knee-joint.
6. Its tendon.	
7. Outer head of gastrocnemius.	7, 8. Raise the heel.
8. Soleus.	
9. Its insertion into the os calcis.	9. Ligament of the heel.
10. Peroneus longus.	10, 11, 12. Raise outside of foot.
11. Its tendon passing around external malleolus.	
12. Its tendon passing under the sole of foot.	
13. Peroneus tertius.	13, 14. Bend the ankle-joint.
14. Its insertion into metacarpal bone.	
15. Peroneus brevis.	15. Raises little toe.
16. Extensor longus digitorum pedis.	16. Bends small toes.
17. Tibialis anticus.	17. Bends the ankle.
18. Tendons of extensor longus digitorum.	18. Raises toes up.
19. Extensor brevis digitorum.	19. Turns foot outward.
20. Abductor minimi digiti.	20. Turns little toe outward.



FIG. I



FIG. III



FIG. II

PLATE XII—LEG AND FOOT, BACK VIEW, DEEP LAYER

PLATE XII—LEG AND FOOT, BACK VIEW, DEEP LAYER

FIG. I

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Femur.	A. Long bone of thigh.
B. Head of the fibula.	B, C. Thin bone on outer side of leg.
C. Fibula.	

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Inner } heads of gastrocnemius.	1, 2. Bend the knee and raise the heel.
2. Outer }	
3. Popliteus.	3. Rotates leg in.
4. Cut portion of soleus.	4. Raises the heel.
5. Peroneus longus.	5, 6. Raise outer side of foot.
6. Peroneus brevis.	
7. Flexor longus pollicis.	7, 7*a*. Bends the large toe.
7*a*. Body of flexor longus pollicis.	
8. Cut end of tendo Achillis.	8. Ligament covering the heel.
9. Tibialis posticus.	9. Bends the foot.
11. Flexor longus digitorum.	11. Bends all small toes.

FIG. II

BONES

Same as FIG. I

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Inner } heads of gastrocnemius.	1, 2. Bend the knee and raise the heel.
2. Outer }	
3. Cut origin of popliteus.	3. Rotates the knee.
4. Cut origin of soleus.	4. Raises the heel.
5. Peroneus longus;	5, 6. Raise outer side of foot.
6. Peroneus brevis.	
7. Cut origin of flexor longus pollicis.	7, 7*a*. Bend the big toe.
7*a*. Cut tendon of the same.	
8. Cut end of tendo Achillis.	8. Ligament covering the heel.
9. Tibialis posticus.	9, 10. Raise inner side of foot.
10. Tendon of above.	
11. Flexor longus digitorum.	11, 12. Bend all small toes.
12. Tendon of above.	

FIG. III

ANATOMICAL NAME	USE OF MUSCLE
1. Os calcis.	1. Bone forming heel.
2. End of flexor longus pollicis.	2, 3. Bend the big toe.
3. Tendon of above.	
4. Peroneus brevis.	4, 5. Raise inner side of foot.
5. Insertion of above.	
6, 7. Tendon of peroneus longus.	6, 7, 8. Raise outer side of foot.
8. Attachment of above.	
9. Tendon of tibialis posticus.	9. Bends the ankle.
10. Tendon of flexor longus digitorum.	10. Bends the big toe.
11. Tibialis posticus.	11, 12. Bend the ankle.
12. Tendon of tibialis posticus.	

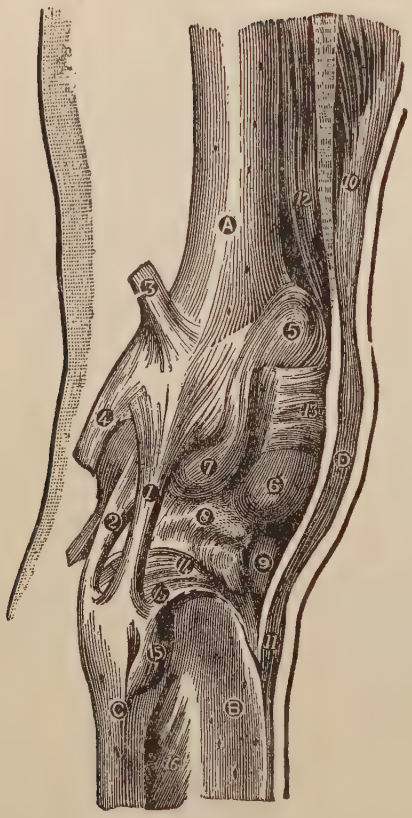


FIG. I



FIG. II

PLATE XIII—KNEE-JOINT

PLATE XIII—KNEE-JOINT

FIG. I. Ligaments on the outer side of the knee-joint.

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Femur.	A. Long bone of the thigh.
B. Tibia.	B. Long bone of the leg.
C. Fibula.	C. Outer bone of the leg.
D. Patella.	D. Knee-cap.

LIGAMENTS AND MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. External lateral ligament.	1, 2. Outer ligaments of knee.
2. Short external lateral ligament.	
3. Tendon of vastus externus.	3. Rotates the knee.
4. Tendon of the outer head of gastrocnemius.	4. Bends the knee.
5, 6, 7. Synovial capsules slightly distended with air to show them more clearly.	5, 6, 7. Capsules of knee-joint.
8. External semilunar cartilage.	8. Cartilage of knee-joint.
9. Synovial capsule of ligamentum patellæ.	9. Capsule of the knee-cap.
10, 11. Tendon of the extensors of the leg.	10, 11. Extend the leg.
12. Muscular fasciculus, which expands over the front of the femur, described as the crureus and subcrureus.	12. Fascia covering long bone of the thigh.
13. External ligament of the patella.	13. Outer ligament of the knee.
14. Insertion of the band of the fascia lata femoris.	14. Bends the knee-joint.
15. Anterior peroneo-tibial ligament.	15, 16. Ligaments of the knee-joint.
16. Interosseous ligament.	

FIG. II

BONES

ANATOMICAL NAME		ORDINARY NAME	
A. Tibia.	B. Patella.	A. Long bone of the leg.	B. Knee-cap.

MUSCLES, ETC.

ANATOMICAL NAME	USE OF MUSCLE
1. Rectus femoris. 2. Tendon of same.	1, 2. Raise the thigh.
3. Lower portion of vastus externus.	3. Pulls leg outward.
4. Lower portion of vastus internus.	4. Draws leg inward.
5. Fascia lata. The extension of this fascia over the front of the limb is shown by the part left across the rectus and vasti muscles.	5. Fascia covering the muscles.
6. Connection of the deeper fibers of the fascia lata with the tendon of the vastus externus.	6. Bends the knee.
7, 8. The more superficial fibers of the fascia lata covering the patella, the ligamentum patellæ, and the inner side of the joint. They terminate over the inner condyle of the tibia.	7, 8. Fascia covering the knee.
9. Sartorius. 10. Tendon of sartorius.	9, 10. Bend the knee.
11. Tibialis anticus.	11. Bends the ankle.
12. Extensor communis digitorum.	12. Extends the small toes.
13. Peroneus longus.	13. Raises the outer side of the foot.
14. External head of gastrocnemius.	14, 15. Bend the knee.
15. Internal head of gastrocnemius.	
16. Soleus.	16. Raises the heel.

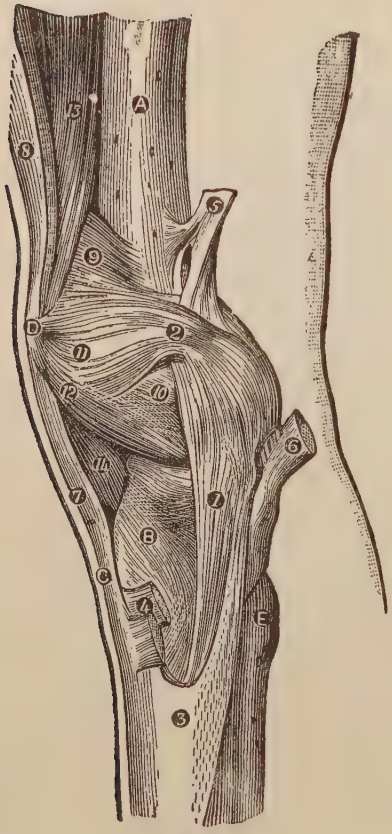


FIG. I



FIG. II

PLATE XIV—KNEE-JOINT

PLATE XIV—KNEE-JOINT

FIG. I. Ligaments on the inner side of the knee-joint.

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Femur.	A. Long bone of the thigh.
B. Internal tuberosity of tibia.	B, C. Top of long bone of the leg.
C. Anterior tuberosity of tibia.	
D. Patella.	D. Knee-cap.
E. Fibula.	E. Outer bone of the leg.

LIGAMENTS

ANATOMICAL NAME	USE OF LIGAMENTS
1. Internal lateral ligament.	1, 2, 3. Inner ligaments of the knee.
2. Its upper attachment to condyle of femur.	
3. Its lower attachment to internal edge and anterior aspect of tibia.	
4. Tendinous attachment for sartorius, semimembranosus, and semitendinosus, sometimes called pes anserina.	4. Bends the knee.
5. Tendon of adductor magnus.	5. Draws the thigh in.
6. Tendon of semimembranosus.	6. Bends the knee.
7. Ligamentum patellæ.	7. Ligament of knee-cap.
8. Tendon of the extensors of the thigh.	8. Draws up the thigh.
9, 10. Synovial capsule of the knee slightly inflated with air.	9, 10. Capsule of knee-joint.
11. Internal ligament of the patella.	11. Inner ligament of knee-joint.
12. Small bundle of ligamentous tissue extending from inner edge of the patella to the internal tuberosity of the tibia.	12. Ligaments of knee-cap.
13. Muscular expansion or fasciculus, which is attached to the upper part of the synovial capsule, sometimes called subcrureus.	13. Fascia over the capsule of the knee.
14. Synovial capsule of the ligamentum patellæ.	14. Capsule of the knee-cap.

FIG. II. Internal view of the knee-joint.

BONES

ANATOMICAL NAME		ORDINARY NAME	
A. Tibia.	B. Patella.	A. Long bone of leg.	B. Knee-cap.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Sartorius.	1. Bends the knee-joint.
2, 3. Two parts of the muscle into which they can be divided. They terminate in a tendinous expansion which covers the inner side of the knee.	2, 3. Raise the leg.
4, 5. Part of the fascia of the thigh, the fibers of which are interwoven with those of the tendon of the sartorius and extend downward to form the fascia of the leg.	4, 5. Fascia of the thigh.
6. Tendon of the gracilis.	6. Bends the knee.
7. Tendon of the semimembranosus.	7, 8. Raise the thigh.
8. Tendon of the semitendinosus.	
9. Vastus internus.	9. Draws the thigh in.
10. Superficial ligamentous expansion covering the knee.	10. Ligaments of the knee-joint.
11. Internal ligament of the patella.	11. Inner ligament of the knee-cap.
12. Internal head of the gastrocnemius.	12. Bends the knee.

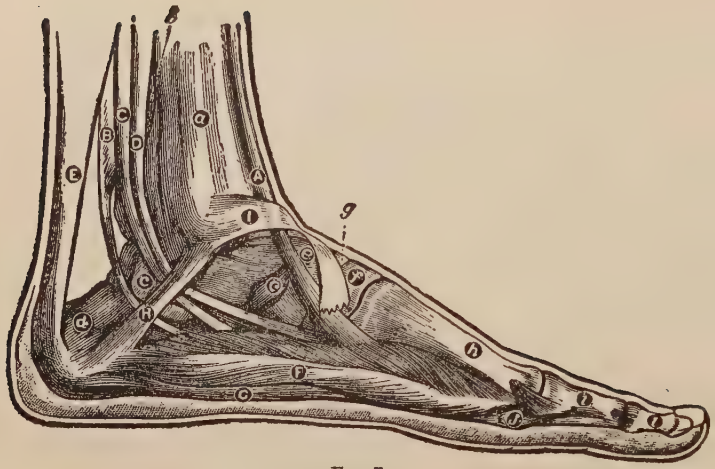


FIG. I

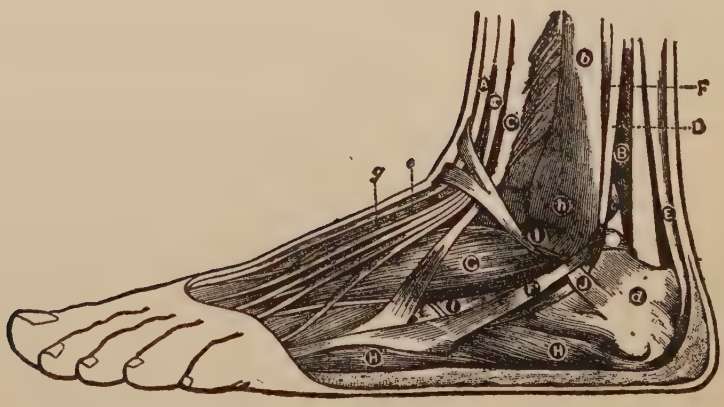


FIG. II

PLATE XV—FOOT

PLATE XV—FOOT

FIG. I

BONES

ANATOMICAL NAME	ORDINARY NAME
a. Inner ankle formed by the lower end of the tibia.	*a.* Inner side of the ankle.
b. Fibula.	*b.* Outer bone of the leg.
c, c'. The astragalus.	*c, c'.* Bone of the foot.
d. Os calcis.	*d.* Bone forming the heel.
e. Scaphoid.	*e, f, g.* Bone forming arch of foot.
f. Cuneiform.	
g. Scaphoid covered with the ligament.	
h. First metatarsal bone.	*h.* Long bone of the foot.
i, i. First and second phalanges.	*i, i.* Bones of toes.
j. Sesamoid bone.	*j.* Extra bone of foot.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
A. Tendon of tibialis anticus.	A. Bends the ankle.
B. Tendon of flexor longus pollicis.	B. Bends the big toe.
C. Tendon of flexor communis longus digitorum.	C. Bends all small toes.
D. Tendon of tibialis posticus.	D. Raises inner side of foot.
E. Tendo Achillis.	E. Tendon covering the heel.
F. Abductor pollicis.	F. Draws large toe outward.
H. Tibia calcaneo ligament.	H. Ligament holding bones of foot together.
I. Annular ligament.	I. Ligament of the ankle-joint.

FIG. II

BONES

ANATOMICAL NAME	ORDINARY NAME
d. Os calcis or calcaneus.	*d.* Bone forming the heel.
e. Scaphoid.	*e, g.* Form arch of foot.
g. Cuneiform.	
h. Fibula forming the outer ankle.	*h.* Outer side of the ankle.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
A. Tendon of tibialis anticus.	A. Bends the ankle.
B. Flexor longus pollicis.	B. Bends the large toe.
C. Extensor longus digitorum.	C, C', D. Raise the foot.
C'. Peroneus tertius.	
D. Peroneus longus.	
E. Tendo Achillis.	E. Tendon covering the heel.
F. Peroneus brevis.	F, F'. Raise inner side of the foot.
F'. Its tendon before its insertion.	
G. Flexor brevis digitorum.	G. Bends small toes down.
H. Abductor minimi digiti.	H. Draws toe inward.
I. Commencement of annular ligament.	I. Ligament of the knee.
J. External lateral ligament.	J. Outer ligament of the ankle.

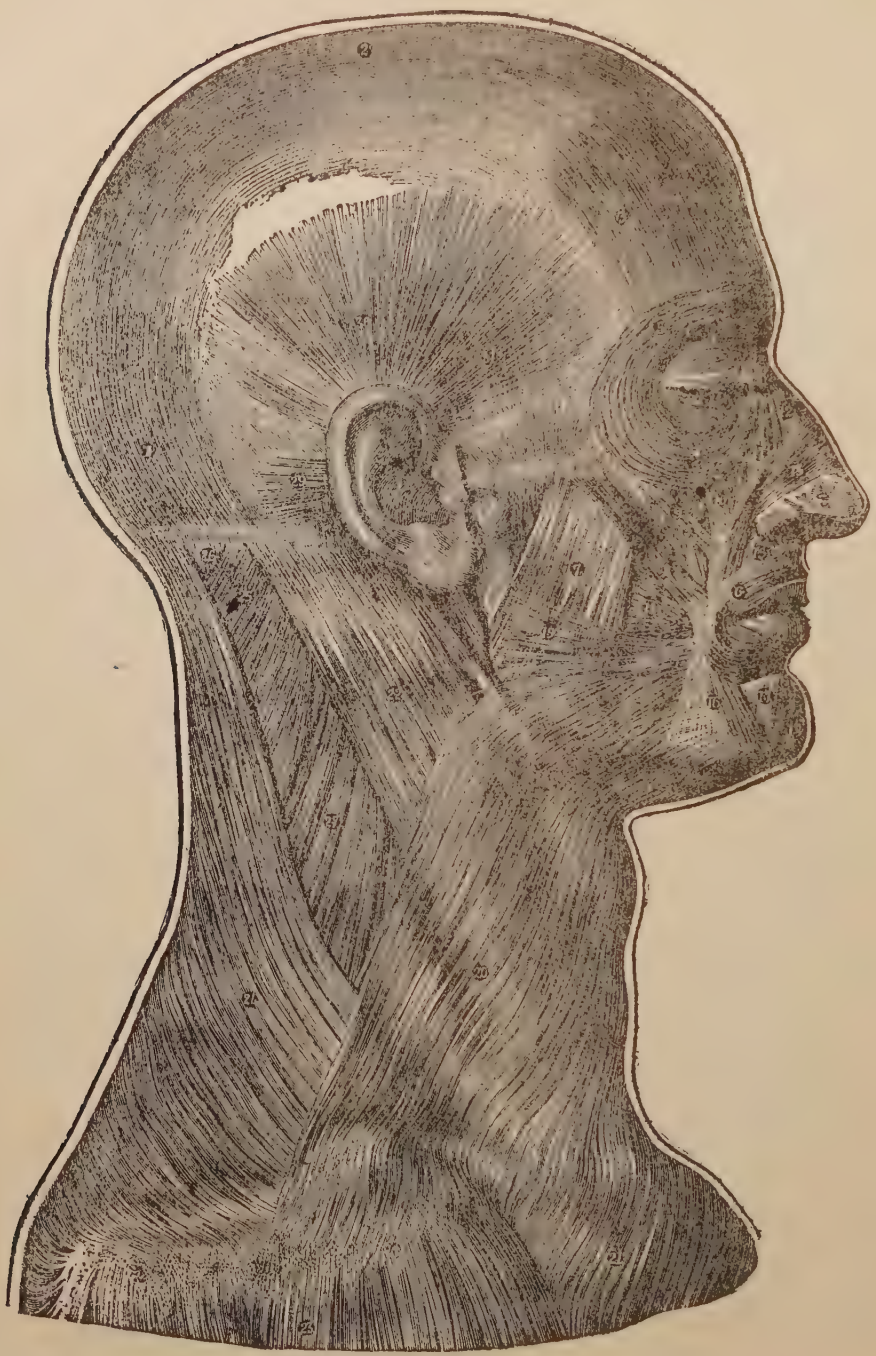


PLATE XVI—HEAD AND NECK

PLATE XVI—HEAD AND NECK

ANATOMICAL NAME	USE OF MUSCLE
1. Occipito-frontalis, occipital portion.	1. Aids in raising the head backward.
2. Occipito-frontalis, tendinous aponeurosis.	2. Tendon part of large muscle covering the scalp.
3. Occipito-frontalis, frontal portion.	3. Raises the eyebrows.
4. Occipito-frontalis, frontal insertion.	4. Wrinkles the forehead.
5. Orbicularis palpebrarum.	5. Supports the eyeball.
6. Orbicularis oris.	6. Forms the outline of the mouth.
7. Masseter.	7. Raises the lower jaw.
8. Zygomaticus major.	8. Changes the shape of the mouth.
9. Zygomaticus minor.	9. Branch of Muscle No. 8.
10. Levator labii superioris proprius.	10. Raises the upper lip.
11. Levator labii superioris alæque nasi.	11. Gives shape to side of nose.
12. Pyramidalis nasi.	12. Protects bridge of nose.
13. Compressor nasi.	13. Opens up sides of nose.
14. Buccinator.	14. Stretches mouth sideward.
15. Depressor alæ nasi.	15. Helps to spread the nose.
16. Depressor anguli oris (or triangularis menti).	16. Lowers the angle of the mouth.
17. Depressor labii inferioris (or quadratus menti).	17. Pulls down the lower lip.
18. Levator labii inferioris (or levator menti).	18. Forms shape of chin.
19. Risorius.	19. Pulls lower lip sideward.
20. Platysma myoides.	20, 21. Help to lower the whole jaw.
21. Pectoral fibers of platysma.	
22. Sterno-mastoid.	22. Turns head sideward.
23. Deltoid.	23. Lowers the collar-bone.
24. Trapezius.	24. Raises head upward.
25. Splenius colli.	25, 26. Pull head back.
26. Complexus.	
27. Levator anguli scapulæ.	27. Raises shoulder-blade.
28. Scalenus posticus.	28. Holds neck erect.
29. Retrahens aurem.	29. Pulls ear backward.
30. Attollens aurem.	30. Raises ear up.
31. Attrahens aurem.	31. Pulls ear upward and to front.

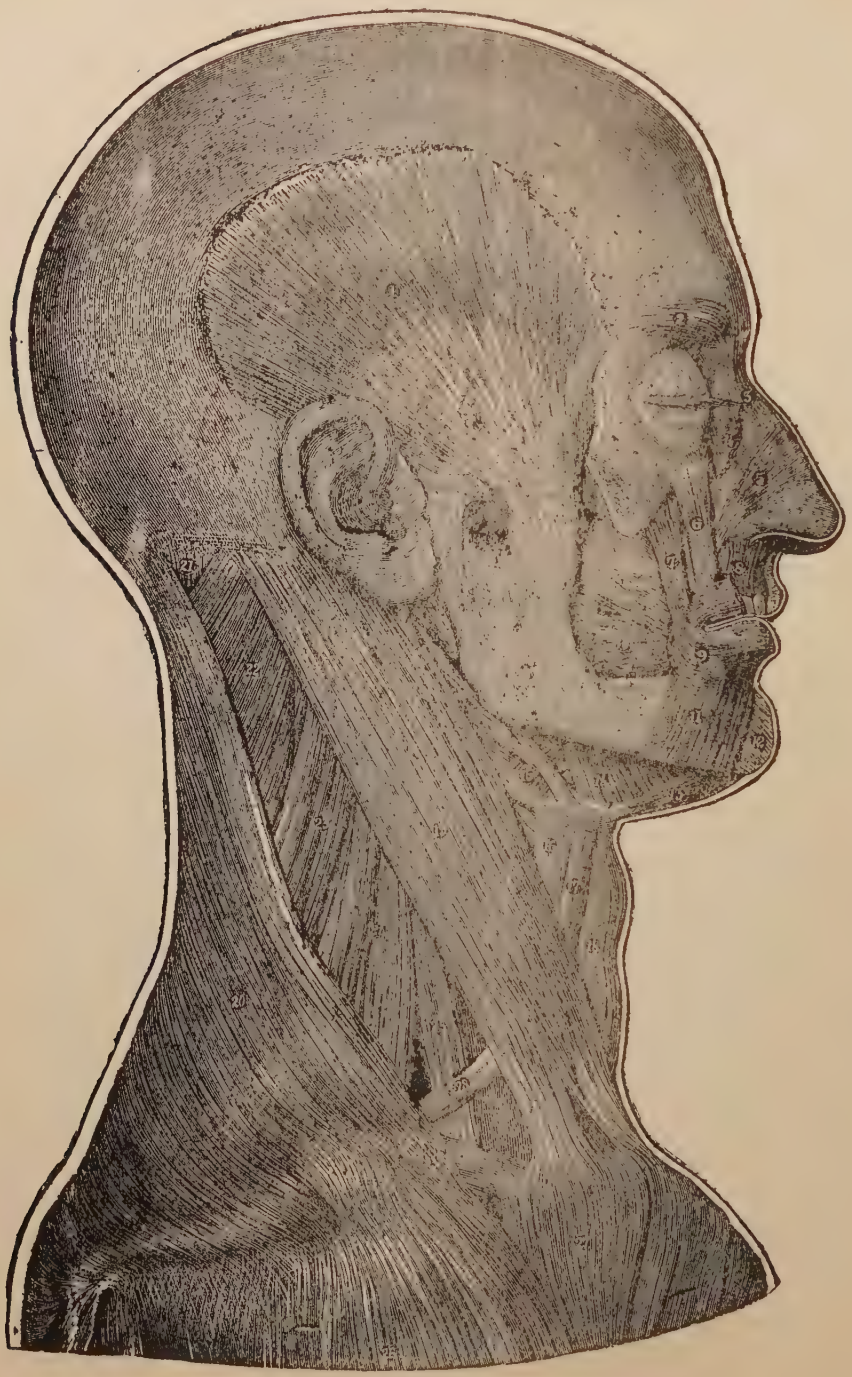


PLATE XVII—HEAD AND NECK, SECOND LAYER

PLATE XVII—HEAD AND NECK, SECOND LAYER

ANATOMICAL NAME	USE OF MUSCLE
1. Temporal muscle.	1. Raises lower jaw.
2. Corrugator supercilii.	2. Moves the eyebrow.
3. Pyramidalis nasi.	3. Forms bridge of nose.
4. Levator labii superioris alæque nasi.	4. Forms side of nose.
5. Compressor nasi.	5. Changes shape of nose.
6. Levator labii superioris proprius.	6. Raises upper lip.
7. Levator anguli oris.	7. Pulls up angle of mouth.
8. Depressor alæ nasi.	8. Pulls down middle of nose.
9. Orbicularis oris.	9. Forms outline of mouth.
10. Buccinator.	10. Stretches mouth sideward.
11. Depressor labii inferioris.	11. Pulls down lower lip.
12. Levator menti (or levator labii inferioris).	12. Forms shape of chin.
13. Digastric.	13. Pulls down lower jaw.
14. Mylo-hyoid.	14. Raises hyoid bone.
15. Hyo-glossus.	15. Branch of Muscle No. 14.
15*a*. Stylo-hyoid.	15*a*. Branch of Muscle No. 15.
16. Thyro-hyoid.	16. Raises thyroid gland.
17. Anterior belly of omo-hyoid.	17, 18. Lower hyoid bone.
18. Sterno-hyoid.	
19. Sterno-mastoid.	19. Turns head sideward.
20. Trapezius.	20. Raises head upward.
21. Complexus.	21. Aids in pulling head backward.
22. Splenius.	22. Holds head erect.
23. Levator anguli scapulæ.	23. Raises shoulder-blade.
24. Scalenus medius.	24. Turns head sideward.
25. Scalenus anticus.	25. Branch of Muscle No. 24.
26. Deltoid.	26. Lowers the collar-bone.
27. Clavicular fibers of pectoralis major.	27. Large muscles of chest.
28. Posterior belly of omo-hyoid.	28. Lowers the hyoid bone.

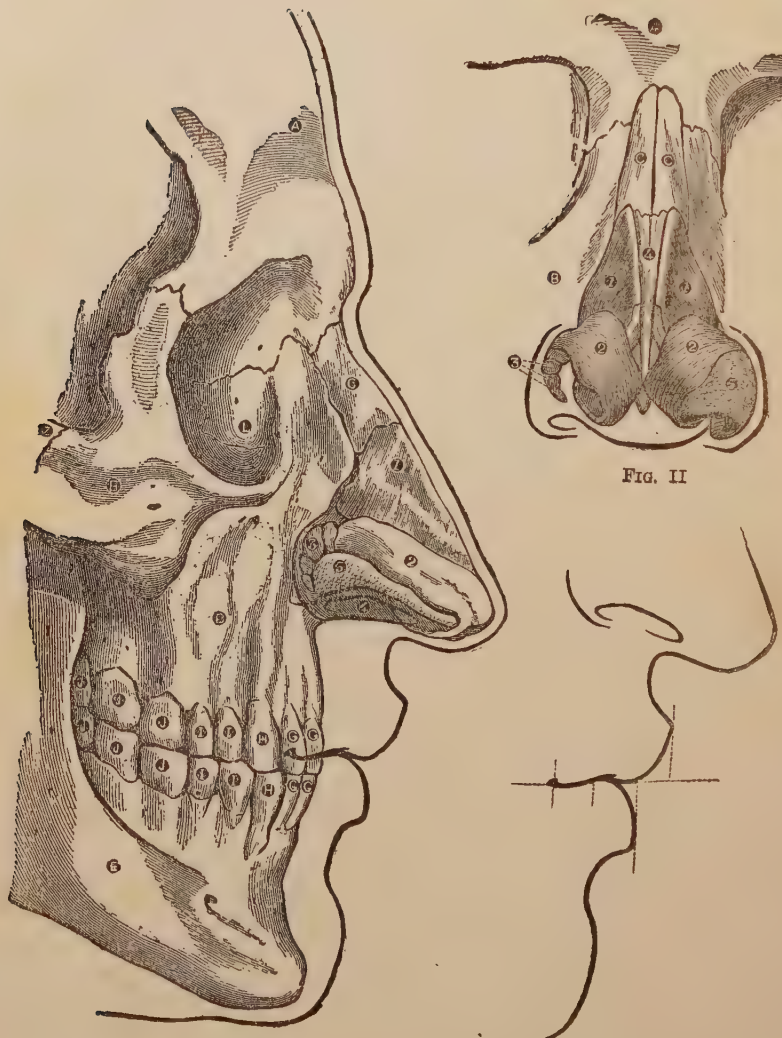


FIG. I

FIG. II

FIG. III

PLATE XVIII—FACE

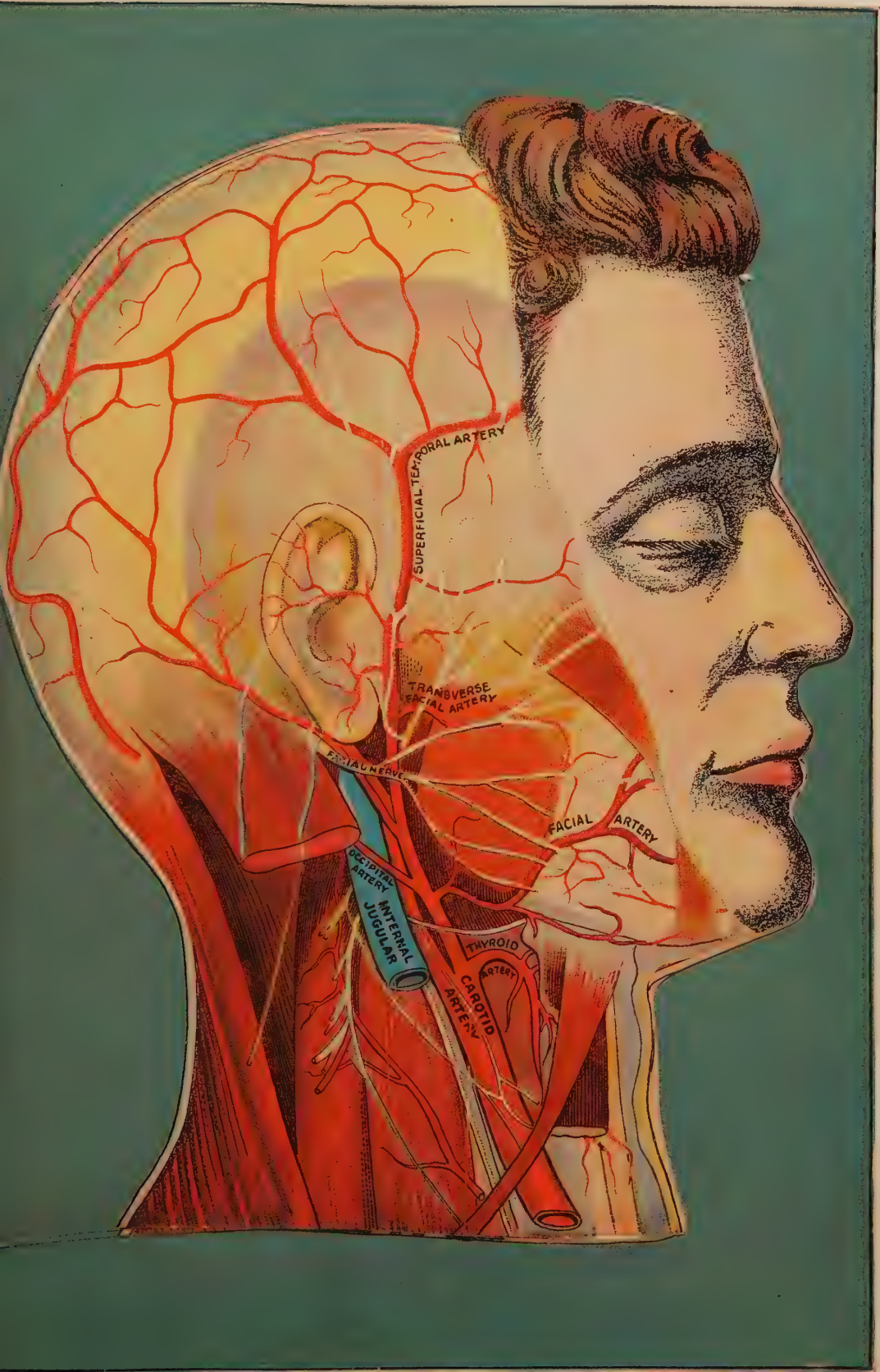

SUPERFICIAL TEMPORAL ARTERY
TRANSVERSE FACIAL ARTERY
FACIAL NERVE
FACIAL ARTERY
OCCIPITAL ARTERY
INTERNAL JUGULAR
THYROID ARTERY
CAROTID ARTERY

PLATE XVIII—FACE

FIG. I. The bones of the face and the cartilages of the nose.

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Frontal bone.	A. Front bone of head.
B. Malar bone.	B. Cheek-bone.
C. Nasal bone.	C. Bones of nose.
D. Superior maxillary.	D. Upper jaw.
E. Inferior maxillary.	E. Lower jaw.
Z. Zygoma.	Z. Continuation of cheek-bone.

TEETH

G. Incisors, four in the upper and four in the lower jaw.
H. Canine teeth, two in each jaw.
I. Small molars, or bicuspid teeth, four in each jaw.
J. Large molars, six in each jaw.

All the thirty-two teeth are planted in sockets called alveolar processes.

Of those usually visible, the incisors are the principal. The two largest are the upper median. The next in size are the upper laterals; then the lower laterals; and lastly, the lower median.

FIG. II. Front view of the cartilages of the nose.

BONES

ANATOMICAL NAME	ORDINARY NAME
A. Frontal bone.	A. Front bone of head.
B. Superior process of the upper maxillary.	B. Lower bones of the nose.
C. Nasal bones.	C. Bones of the nose.

The numbers of the bones are the same in FIGS. I and II

CARTILAGES

ANATOMICAL NAME	ORDINARY NAME
1. Upper lateral cartilage.	1. Upper lateral cartilage.
2. Lower lateral or ala cartilage.	2. Lower lateral cartilage.
3. Sesamoid cartilages with areolar tissue removed.	3. Small pieces of cartilage.
4. Septum.	4. Partition of the nose.
5. Areolar tissue filling out the wing of the nose.	5. Tissue forming slope of nose.

FIG. III. Diagram showing the profile of the upper lip, lower lip, and nostril.

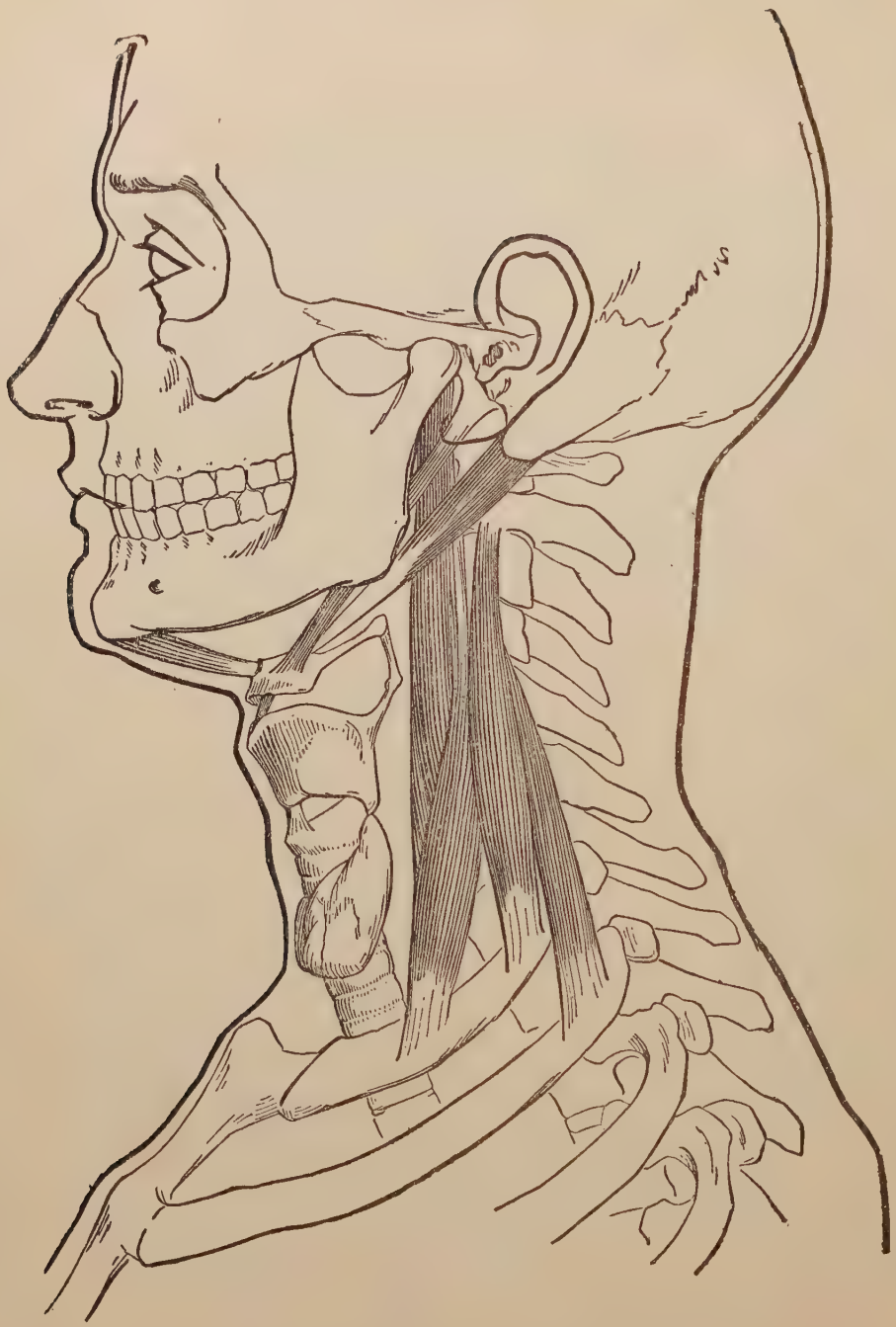


PLATE XIX

PLATE XIX

This diagram shows in greater detail parts that have been figured and described in former plates.

The profile of the chin and front of the neck is modified by the structures that lie beneath the skin and are shown in this plate.

The hyoid bone, commonly called the "wish-bone," is hung between the chin and the prominent cartilage called "Adam's apple." Below this cartilage is hung the thyroid gland. The rings of the trachea are seen coming from below "Adam's apple"; but at the lower part of this tube the outline is softened by the presence of the thyroid gland.

In tracing the profile outline it will be observed that the top of the chin is tied in when it has passed the angle of the lower jaw. Beyond this the outline is soft and gentle, corresponding to the under surface of the tongue.

The thyroid cartilage, or "Adam's apple," gives a strong prominence, especially in the throats of men. In the lower part the upper ribs are seen to join to the heart bone.



PLATE XX—MUSCULAR SYSTEM, FRONT VIEW

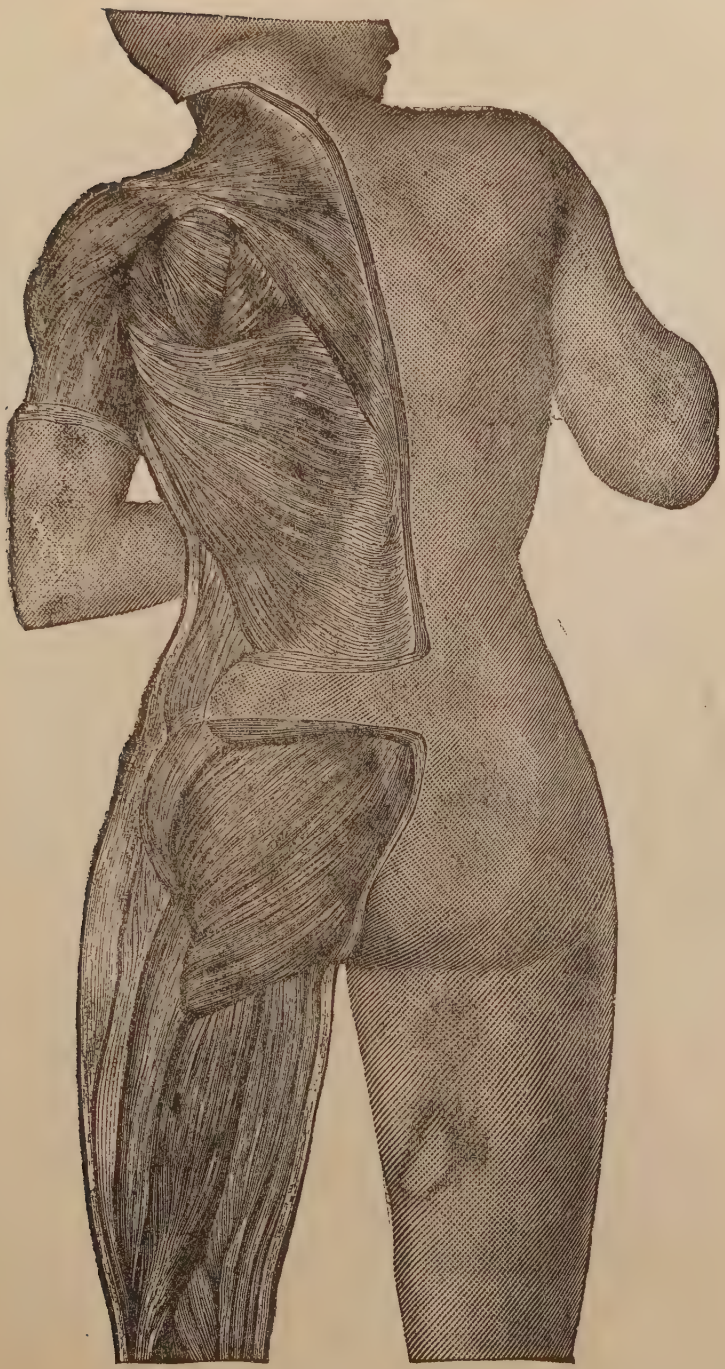


PLATE XXI—MUSCULAR SYSTEM, BACK VIEW



PLATE XXII—BACK, THREE-QUARTER VIEW

PLATE XXII—BACK, THREE-QUARTER VIEW

ANATOMICAL NAME	USE OF MUSCLE
1. Trapezius.	1, 2, 3, 4. Raise the shoulder-blade up.
2. Its origin at occipital bone.	
3. Its scapular insertion.	
4. Its vertebral origin.	
5. Deltoid.	5, 6. Rotate the arm backward.
6. Origin of deltoid from spine of scapula.	
7. Brachialis anticus.	7. Bends the elbow.
8. Outer head of triceps.	8, 9. Pull the arm backward.
9. Long head of triceps.	
10. Pectoralis major.	10. Muscles covering chest pulling shoulder down.
11. Pectoralis minor.	11. Similar to Muscle No. 10.
12. Infra-spinatus.	12, 13. Pull the shoulder down.
13. Teres minor.	
14. Teres major.	14. Rotates the arm backward.
15. Latissimus dorsi.	15. Pulls the arm down.
16. Serratus magnus.	16. Raises the ribs.
17. Obliquus abdominis externus.	17. Muscle of abdominal wall.
18. Lumbar aponeurosis.	18. Tendon of back muscles.
19. Posterior part of the crest of ilium.	19. Upper portion of back part of hip-bone.
20. Gluteus medius.	20, 21. Pull the leg backward.
21. Gluteus maximus.	
22. Sacrum.	22. End of the spinal column.

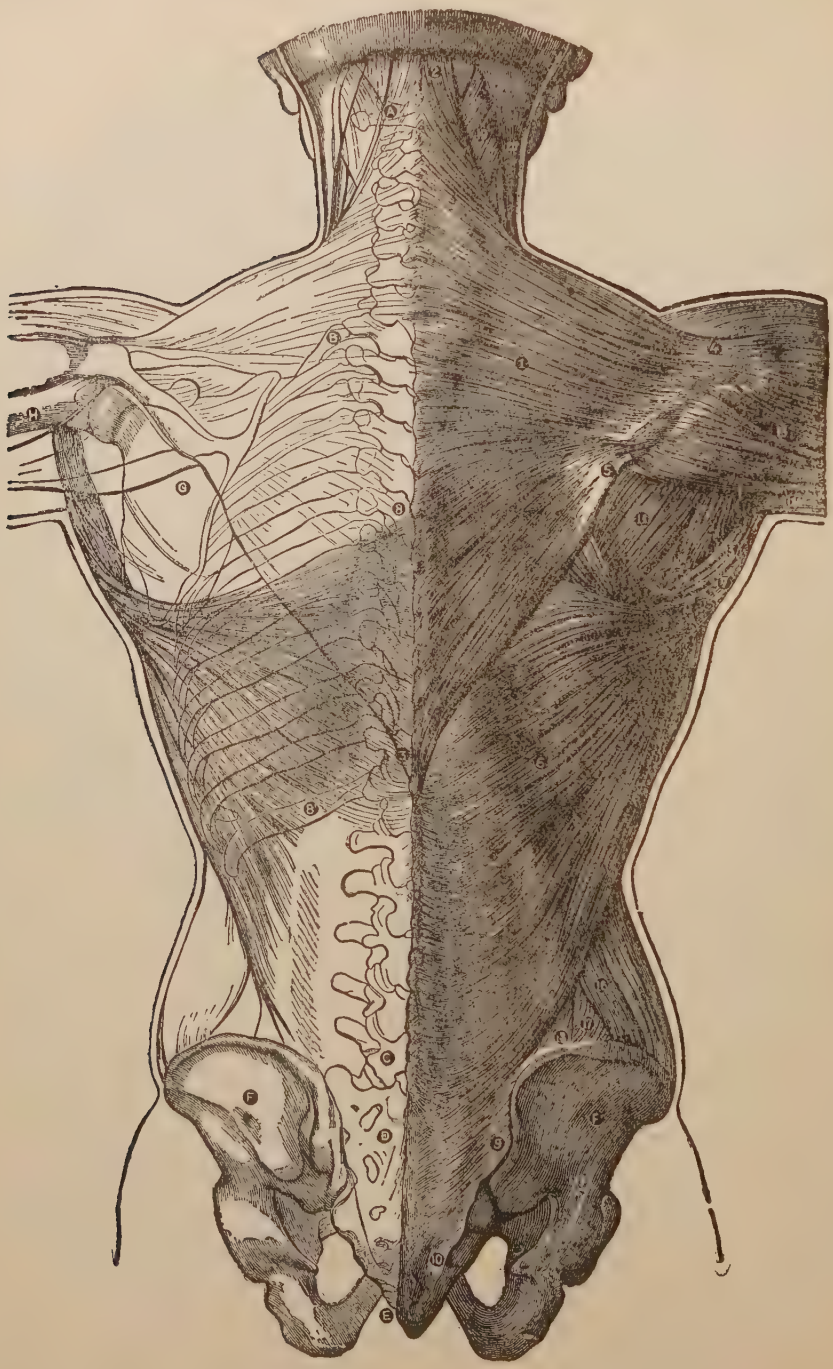


PLATE XXIII—BACK

PLATE XXIII—BACK

BONES

ANATOMICAL NAME	ORDINARY NAME
A. First cervical vertebra, or atlas.	A. Top of spinal column.
B. First rib.	B. First rib.
B′. Last rib.	B′. Last rib.
C. Last lumbar vertebra.	C. Last lumbar vertebra.
D. Sacrum.	D. Sacrum.
E. Coccyx.	E. Tip of spinal column.
F, F′. Ilium.	F, F′. Hip-bone.
G. Scapula.	G. Shoulder-blade.
H. Humerus.	H. Long bone of arm.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Trapezius.	1, 2. Pull arm upward.
2. Its occipital origin.	
3. Its vertebral origin.	3, 4, 5, 6, 7. Pull arm downward.
4, 5. Its scapular insertion.	
6. Latissimus dorsi.	
7. Its head winding round scapula to its insertion.	
8. Vertebral origin of trapezius.	8, 9, 10. Pull arm backward.
9. Iliac origin of latissimus dorsi.	
10. Sacral origin.	
11. Infra-spinatus.	11, 12. Pull arm downward.
12. Teres minor.	
13. Teres major.	13. Rotates arm inward.
14. Long head of triceps.	14. Pulls elbow backward.
15. Deltoid.	15. Rotates arm out.
16. Obliquus abdominis externus.	16, 17, 18. Muscles of abdominal wall.
17. Obliquus abdominis internus.	
18. Lumbar fascia.	
19. Splenius.	19, 20. Rotate the head.
20. Sterno-mastoid.	

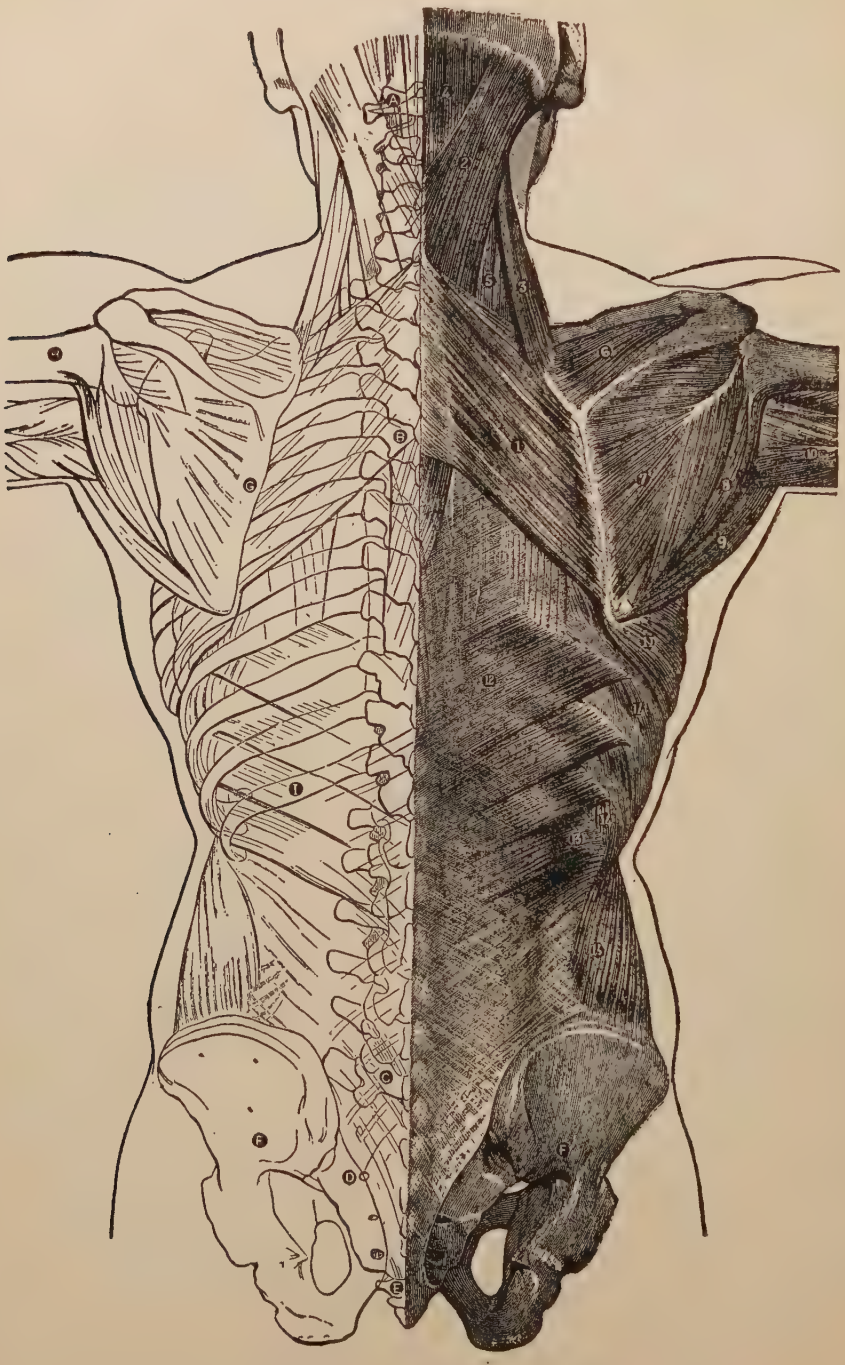


PLATE XXIV—BACK, DEEP LAYER

PLATE XXIV—BACK, DEEP LAYER

BONES

ANATOMICAL NAME	ORDINARY NAME
A. First cervical vertebra, or atlas.	A. Top of spinal column.
B. Fourth dorsal vertebra.	B. Fourth vertebra of the thorax.
C. Last lumbar vertebra.	C. Last vertebra of the lumbar region.
D. Sacrum.	D. Sacrum.
E. Coccyx.	E. Tip of spinal column.
F. Ilium.	F. Hip-bone.
G. Scapula.	G. Shoulder-blade.
H. Humerus.	H. Long bone of arm.
I. Last rib.	I. Last rib.

MUSCLES

ANATOMICAL NAME	USE OF MUSCLE
1. Rhomboideus major.	1. Raises the shoulder-blade up and backward.
1′ Rhomboideus minor.	1′. Similar to Muscle No. 1.
2. Splenius.	2. Holds head erect.
3. Levator anguli scapulæ.	3. Pulls shoulder-blade up.
4. Complexus.	4, 5. Pull head backward.
5. Scalenus posticus.	
6. Supra-spinatus.	6, 7. Hold arm in position.
7. Infra-spinatus.	
8. Teres minor.	8, 9. Pull arm down and backward.
9. Teres major.	
10. Long head of triceps.	10. Pulls elbow backward.
11. Serratus magnus.	11. Covers front of chest.
12. Serratus posticus inferior.	12, 13. Cover back of chest.
13. Last head of serratus posticus inferior.	
14. Intercostales.	14. Covers space between the ribs.
15. Obliquus abdominis internus.	15. Muscle of abdomen.

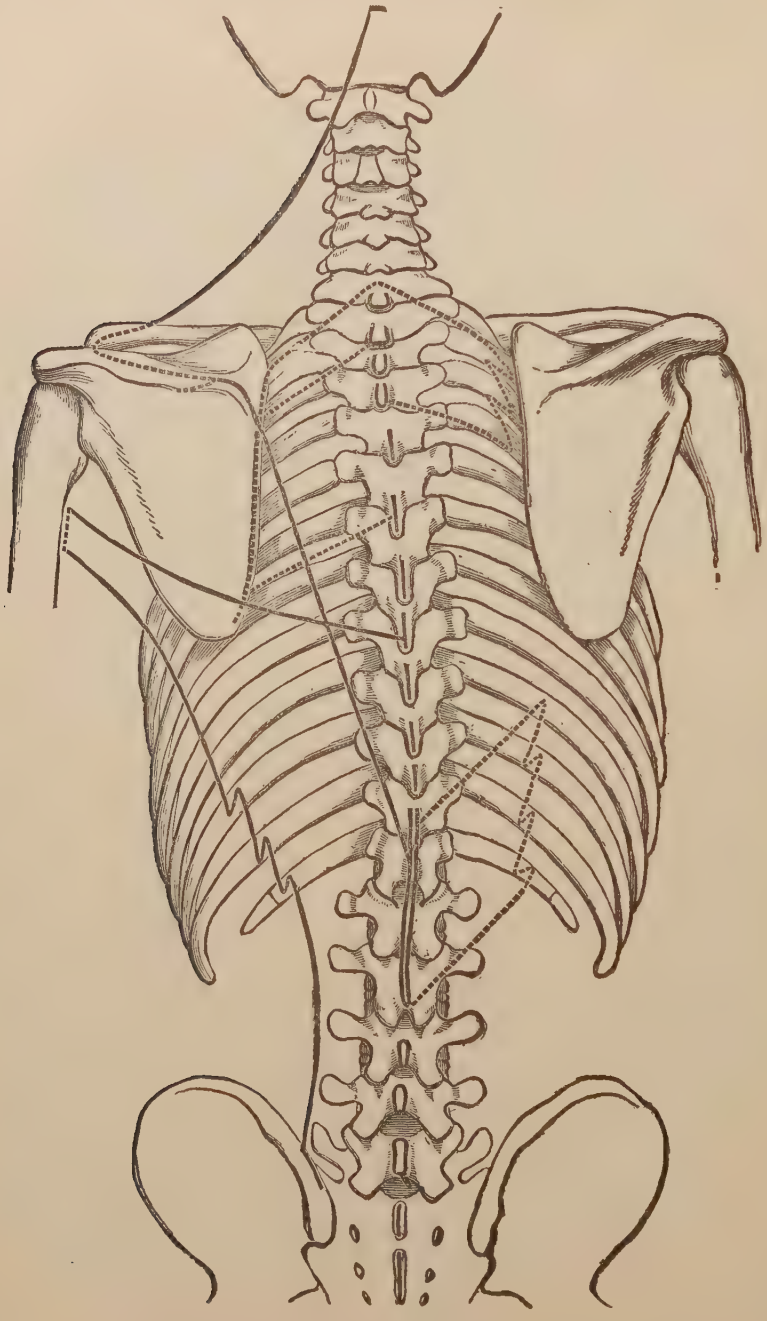


PLATE XXV—VERTEBRÆ AND RIBS, BACK VIEW

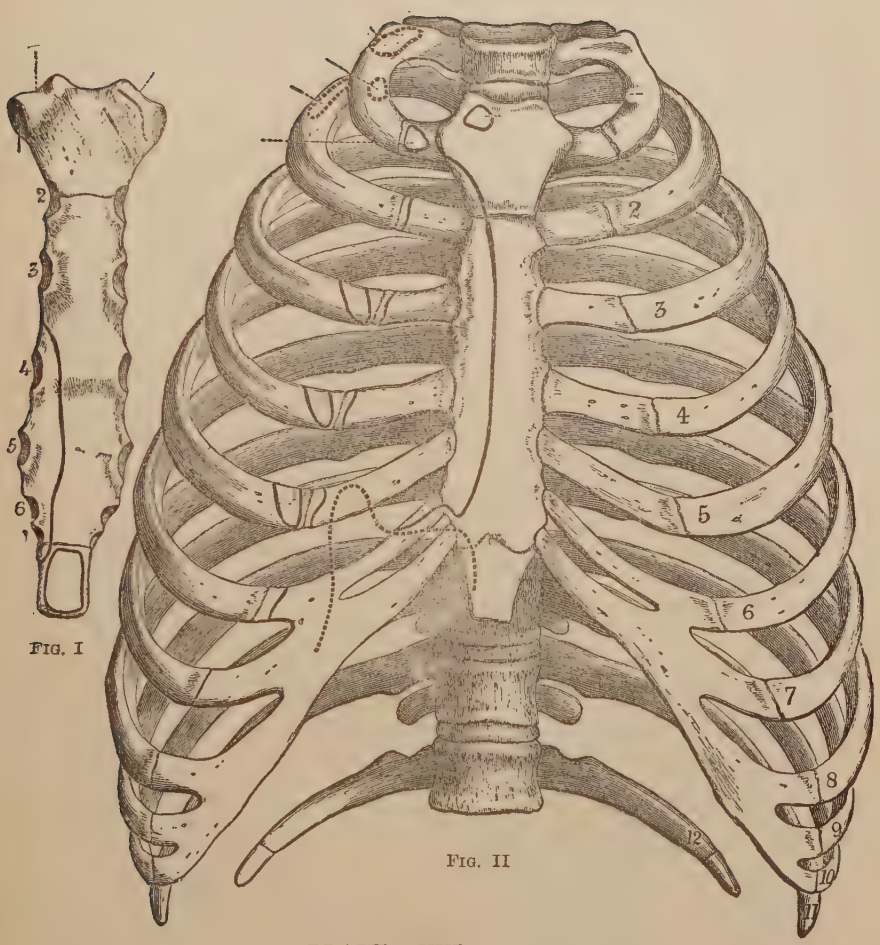


FIG. I

FIG. II

PLATE XXVI—THORAX

FIG. I. Sternum, from inside. FIG. II. Thorax.

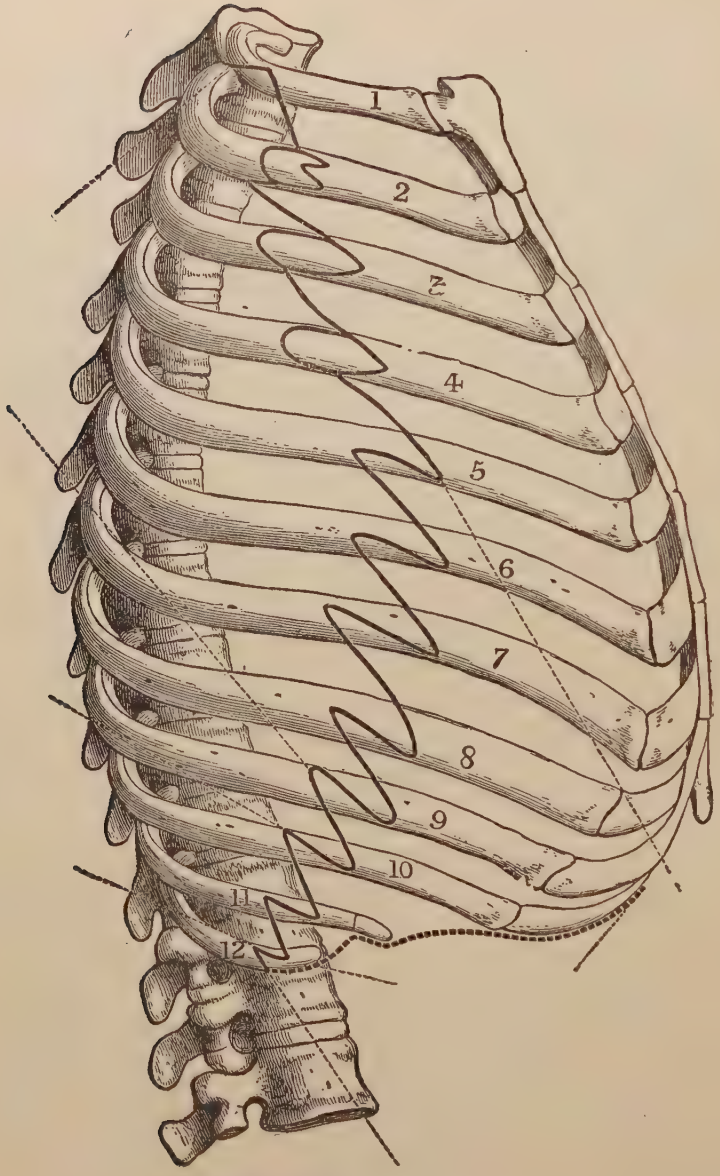


PLATE XXVII—RIBS, SIDE VIEW

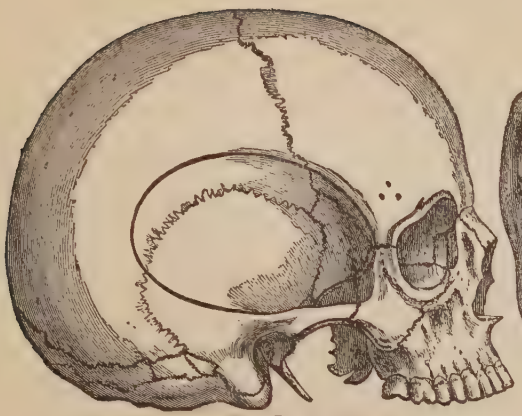


FIG. I. Skull



FIG. II. Upper Jaw



FIG. III. Lower Jaw, external

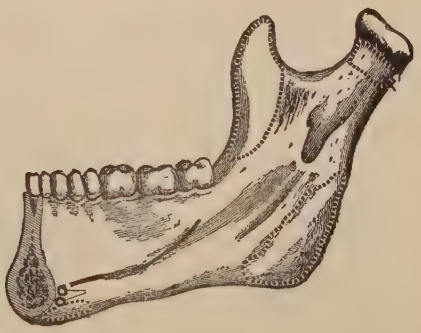


FIG. IV. Lower Jaw, internal



FIG. V. Cheek (or Malar) Bone

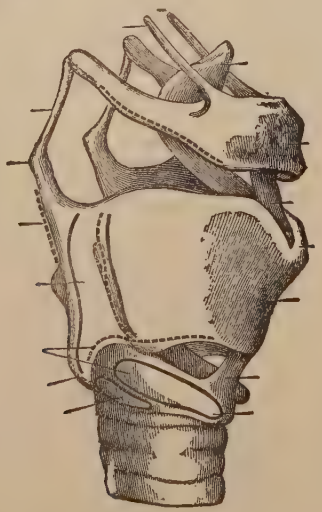


FIG. VI. Larynx

PLATE XXVIII—BONES OF THE SKULL

DISEASES OF THE MUSCLES

The muscles are singularly free from liability to diseases which commonly affect other tissues, this being the result, probably, of their activity, good blood-supply, and the changes constantly taking place in them. Wasting of muscles sometimes occurs as a symptom of disease in other organs—for example, damage to the nervous system, as in infantile paralysis, or in the disease known as progressive muscular atrophy.

MYOPATHY

Definition.—Myopathy, also known as *muscular dystrophy* or *idiopathic muscular atrophy*, is the term applied to a somewhat rare condition in which wasting takes place in certain muscles, with or without previous increase in bulk of these muscles, and apparently without any affection of the nervous system.

Causes.—The cause of the condition is still obscure, though the disease appears to run in families, being transmitted, like some other hereditary diseases, by the mothers. Generally the disease appears in early childhood, and it seldom affects persons over the age of twenty. The changes which are found after death show that a simple wasting away of the muscle fibers takes place, and that these are in some cases to a great extent replaced by deposits of fatty and fibrous tissue.

Symptoms.—There are three chief types of myopathy. The commonest, known as pseudo-hyertrophic paralysis, affects particularly the upper part of the lower limbs of children. The muscles of buttocks, thighs, and calves seem excessively well developed, but nevertheless the child is clumsy, weak on his legs, and has difficulty in picking himself up when he falls. In another form of the disease, which begins a little later, as a rule about the age of fourteen, the muscles of the upper arm are first affected, and those of the spine and lower limbs become weak later on. In a third type, which begins about this age, the muscles of the face, along with certain of the shoulder and upper arm muscles, show the first signs of wasting. All the forms have this in common, that the affected muscles grow weaker till their power to contract is quite lost. In the first form, the patients

seldom reach the age of twenty, falling victims to some disease which to ordinary persons would not be serious, such as a mild attack of bronchitis, which their feeble frame is incapable of resisting. In the other forms, recovery is said sometimes to take place.

Treatment.—The nutrition must be exceptionally well maintained, and various tonics are of use. Massage, electricity, and exercise short of fatigue are of the utmost importance, and, above all, care must be taken that these invalids are not exposed unduly, as they succumb easily to chest affections.

CRAMPS

Definition.—Cramp is a painful spasmodic contraction of muscles, most frequently occurring in the limbs, but also apt to affect certain internal organs. This disorder belongs to the class of diseases known as local spasms, of which other varieties exist in such affections as spasmodic asthma and colic.

Causes.—The cause of these painful seizures resides in the nervous system, and operates either directly from the great nerve centers, or, as is generally the case, indirectly by reflex action, as, for example, when attacks are brought on by some derangement of the digestive organs.

Temporary Cramp.—In its most common form, that of cramp in the limbs, this disorder comes on suddenly, often during sleep, the patient being aroused by an agonizing feeling of pain in the calf of the leg or back of the thigh, accompanied in many instances with a sensation of sickness or faintness from the intensity of the suffering. During the paroxysm, the muscular fibers affected can often be felt gathered up into a hard knot. The attack in general lasts but a few seconds, and then suddenly departs, the spasmodic contraction of the muscles ceasing entirely; or, on the other hand, relief may come more gradually during a period of minutes or even hours. A liability to cramp is often associated with a rheumatic or gouty tendency, but occasional attacks are common enough apart from this, and are often induced by some peculiar posture which a limb has assumed during sleep. Exposure of the limbs to cold will also bring on cramp. It is likewise of frequent occurrence in the process of parturition.

Treatment.—This painful disorder can be greatly relieved and often entirely removed by firmly grasping or briskly rubbing the affected part with the hand, or by anything which makes an impression on the nerves, such as the application of some cold substance to the part, or occasionally by warmth. Even a sudden and vigorous movement of the limb, in such a direction as to stretch the affected muscle, will often succeed in terminating the attack.

Cramp of Swimmers includes usually spasm of the arteries as well as of the muscles due to cold and exertion, so that death is apt to occur from stoppage of the heart. If treatment can be applied, friction of the limbs, warmth, and hot drinks are essential.

Cramp of the Stomach, or *gastralgia*, occurs as a symptom in connection with some form of gastric disorder.

Habit Spasms, or functional spasms, are liable to occur in individuals of almost any handicraft, and are often extremely troublesome.

Symptoms and Varieties.—*Writer's cramp*, or *Scrivener's palsy*, is a spasm which affects certain muscles when engaged in the performance of acts the result of education and long usage, and which does not occur when the same muscles are employed in acts of a different kind. This disorder owes its name to the relative frequency with which it develops in persons who write much, although it is by no means confined to them.

The symptoms are in the first instance a gradually increasing difficulty experienced in conducting the movements required for executing the work in hand. Taking, for example, the case of writers, there is a feeling that the pen cannot be moved with the same freedom as before, and the handwriting is more or less altered in consequence. At an early stage of the disease, the difficulty may be to a large extent overcome by persevering efforts, but ultimately, when the attempt is persisted in, the muscles of the fingers, and occasionally also those of the forearm, are seized with spasm or cramp, so that the act of writing is rendered impossible. Sometimes the fingers, instead of being cramped, move in a disorderly manner and the pen cannot be grasped, while in other rare instances a kind of paralysis affects the muscles of the fingers, and they are powerless to make the movements necessary for holding the pen. It is to be noted that

it is only in the act of writing that these phenomena present themselves, and that for all other movements the fingers and arms possess their natural power. The same symptoms are observed and the same remarks apply *mutatis mutandis* in the case of musicians, typists, artists, compositors, seamstresses, tailors; they are also observed in many mechanics in whom this affection may occur.

Spasmodic wryneck is one of the most frequent forms which the disease takes. This comes on in shoemakers, bookfolders, and persons generally whose employment necessitates their following, with the head, movements which the hands are making. The result is that the muscles of the neck assume the unpleasant habit of drawing the head to one side whenever the slightest attempt is made to turn and look at anything. Indeed, although actually a rare disease, no muscle or group of muscles which is specially called into action in any particular occupation is exempt from liability to this functional spasm. Hence the cause has been ascribed to overuse of the parts concerned, although this is regarded as doubtful by many high authorities, since cases have been observed where there had been no excessive strain upon the function of the affected muscles, while again in persons who pursue their special occupation even to the utmost possible amount of fatigue, the symptoms of this disorder are exceedingly rare. It is difficult to account for the phenomena on any other theory than that of defective controlling power in the activity of the nerve cells in the spinal cord that initiate the muscular movements in question. At all events, the complaint is greatly aggravated by overexertion of the parts.

Treatment.—In the treatment of habit spasms, the only effectual remedy is absolute cessation from the work with which the attack is associated. It is sometimes recommended that the opposite hand or limb be used so as to afford the affected part entire rest, but this is generally followed by the extension of the disease to that locality also. Peculiar forms of penholder and other mechanical contrivances have been suggested so as to enable the occupation to be carried on, but they do not afford any relief to the disease, for the cure of which the only means that can be relied on is entire rest. Various types of electrical application have been tried, and have in some cases been attended with at least temporary benefit.

INFLAMMATION OF THE MUSCLES

Inflammation of various types may occur. As the result of injury, an abscess may develop, though wounds affecting muscle generally heal well. Tubercular inflammation in muscles is almost unknown. Syphilis is the disease which perhaps more than any other affects the muscular system, a growth due to this disease, known as a "gumma," frequently forming a hard, almost painless swelling in a muscle. Rheumatism is another type of chronic inflammation to which muscles are very liable. Fibroid and even bony degeneration may occur in muscles which are the seat of long-continued irritation, or which receive a poor blood-supply, the former, for example, taking place under certain circumstances in the heart, the latter affecting the thigh muscles of those who ride very much.

Rupture of the Muscles.—Rupture of a muscle may occur, without any external wound, as the result of a spasmodic effort. It may tear the muscle right across, as sometimes happens to the feeble plantaris muscle in running and leaping, or part of the muscle may be driven through its fibrous envelope, forming a "hernia" of the muscle. Both conditions give rise to considerable pain, but are relieved by rest and massage.

Pain in the Muscles.—Pain, quite apart from any inflammation or injury, may be experienced on exertion. This type of pain, known as myalgia, occurs especially in weakly persons, and is relieved only by rest and tonic treatment.

Parasites in the Muscles.—Parasites sometimes lodge in the muscles, the most common being *Trichina spiralis*, producing the disease known as trichinosis.

Tumors of the Muscles.—Tumors are occasionally met with, the most common being fibroid, fatty, and sarcomatous growths.

WOMEN'S PHYSICAL CHANGES AND THEIR DISORDERS

INTRODUCTION

IN this department we have endeavored to convey to the general reader the importance of a thorough understanding and knowledge of "Women's Physical Changes and Disorders" as compared with "Women's Diseases." By perusing the following pages the reader will comprehend and readily understand that in many instances, were a slight disorder taken in hand and remedied in the beginning, it would not only be the means of saving a great deal of suffering and sickness, but possibly life-long misery.

We must admit that conditions have changed considerably with the past decade, and we are happy to say for the better. Not many years ago women were not expected to have any definite knowledge as to the functions of the generative organs, and how they could arrange their daily life so as to bring brighter, healthier, and better children into the world, one of the greatest privileges ever bestowed upon human beings. Of late years there have been several books published and placed in the homes, so that women have been able to obtain a great deal of valuable information on this subject, and we take pleasure therefore in adding another to the list, that contains additional information of recent research and that has not been published heretofore.

DISORDERS OF MENSTRUATION

This function has been very appropriately termed "the sign and guardian of the female health," and as it is frequently disordered to a greater or less degree, its perfect health is the exception instead of being the rule in human society. It is gener-

ally admitted by physicians that in a very large number of apparently healthy women, taken indiscriminately, only in about one fourth of them is menstruation free from morbid symptoms; while in the others it is preceded or accompanied by more or less disturbance, pain, and uneasiness. The ovaries are the controlling factors in the menstrual function, and there is no organ which is so prone to disease.

Disordered menstruation, attended by more or less pain, is so common that women usually regard it as a natural and unavoidable ill, and unless it should be severe they are positively indifferent to it. This is, however, a very mistaken, misleading, and dangerous opinion. It is indisputable that menstruation was intended by nature to be free from pain and uneasiness, and this is proved by the painless elimination from the body of all other secretions. Therefore, though the pain may be deemed natural, it should not be present, as menstruation cannot be regarded as typically healthy when it is attended by pain or uneasiness. The perfect condition of menstruation should be to woman a criterion of health, and any disturbance should be regarded and heeded as a warning. Serious menstrual disease is often induced by disregarding the common and slightest symptoms at the beginning.

The more important disorders of menstruation will now be considered, and as more or less women are subject to some, if not all, of these disorders, the following articles cannot fail to be of interest and exceptional value to the female reader.

ABSENT MENSTRUATION—AMENORRHEA

Definition.—This term implies an absence or lack of the menstrual flow—a very common disorder. It is classified under two kinds: the amenorrhea of suppression and of retention. By retention is meant that the menstrual flow has never appeared; and by suppression, that it has ceased.

Retention of Menses.—Retention of menses may be due to either a congenital defect of the sexual organs, that is, a defect at birth, or to a lack of power in the constitution to establish puberty and thus put the menstrual functions in motion. Congenital deficiency is, however, very rare, but there are cases in which the womb or the ovaries are entirely absent or imperfectly developed, so that menstruation cannot take place. In these

cases the sexual desire is entirely absent, and the appearance, tone of voice, and other features usually have a somewhat masculine character. There is no remedy for such cases, and all that can be done by those who are so unfortunate as to have been born sexually imperfect is to console themselves with the reflection that there are many other blessings in the world besides those of sex, which too often are a curse instead of a blessing.

Suppression of Menses.—The amenorrhea of suppression is by far a more common malady than that of retention, and therefore of much greater importance to society. Medical men divide this derangement into two kinds: acute and chronic.

Acute Suppression.—When the menstrual flow ceases suddenly, it is called acute. This is usually produced by one of two causes, cold and violent mental emotion. When menstruating women are exposed to cold, damp feet, or receive a sudden shock such as grief or fright, the discharge is often suddenly arrested and acute symptoms of inflammation and congestion in the ovaries and womb occur.

Symptoms.—In such cases, acute pain is felt in the lower part of the abdomen and a feeling of weight and uneasiness in the pelvis. The pulse is quick and the patient is anxious and excited, and nausea is also usually present.

Treatment.—The treatment should be soothing and relaxing. A general bath at a temperature of 98° F. should be given; also some purgative such as Epsom or Rochelle salts and ipecac.

If amenorrhea (deficient menstruation) is caused by anemia, the imperfect formation of the genital organs, or by obstruction of the flow of blood, the following prescription is very beneficial; it should not be taken if the trouble is due to pregnancy.

℞ Ovarian Substance (Lutein) five grain tablets
Dose: One or two tablets after meals.

Or:

℞ Tincture of Chloride of Iron ...three drams
Tincture of Spanish Fly one dram
Tincture of Guaiac Ammoniata. one and one-half ounces
Tincture of Aloes half ounce
Syrup enough to make six ounces
Mix.
Dose: One tablespoonful three times a day.

When amenorrhea is caused by anemia, the patient should spend as much time as possible outdoors, be placed on a liberal diet, and drink from one to two quarts of fresh milk every day.

The following prescription will be found very helpful:

℞ Manganese Binoxide two-grain pills
Dose: One pill three times a day, half an hour after meals.

An injection of olive-oil, castor-oil, and glycerine into the rectum often affords relief, but the injection must be retained for a while with a soft silk sponge or napkin, and should consist of the following:

℞ Glycerine two ounces
Olive-oil four ounces
Castor-oil two ounces
Mix.
Directions: Give injection at about 100° F., following one hour later with a soap-suds enema.

The pain and congestion will be relieved, and the discharge will perhaps return at once, although this is not always a certainty. Whether the discharge returns or not, no subsequent treatment should be employed until just before the next menstrual period. It will then be well to take every precaution to induce the return of the flow, and therefore fatigue and cold should be strictly avoided, the bowels kept free and open, and hot mustard hip and foot baths taken on alternate nights for a few nights previously. If menstruation should refuse to return and if white discharges be set up instead, the case becomes one of chronic suppression and must be treated accordingly.

Chronic Suppression.—This may be brought about in many ways. For instance, an attack of acute suppression may gradually become chronic, and after such an attack the function may never return, or if it does, it will be partial. There is a painful effort made at each menstrual period and a small quantity of blood secreted, but even this scanty flow gradually diminishes.

Symptoms.—Chronic suppression of the menstrual flow is of very frequent occurrence, and its constitutional effects are some-

what similar to those caused by other suppressed secretions, such as bile, excreta, etc. They indicate disorder of the nervous system, and later a gradually increasing debility and impoverishment of the entire system. There are spreading and obstinate headaches, occasional dizziness with specks floating before the eyes, and the pupils become dilated. The surface of the body is irregularly hot and cold and easily chilled. The bowels are constipated and there is disordered respiration, palpitation of the heart, and pains in the chest. The general health of the patient fails seriously; all the generative organs are liable to become involved and organic disease may be established in some part.

Treatment.—In cases of chronic suppression the womb should not be neglected, as the condition often arises from ulcerations of the mouth of that organ, as well as from an inflammatory state of the ovaries. When, therefore, any uneasiness or abnormal feeling is experienced in that organ, it is advisable to consult a physician, who, upon making a careful examination, will be able to ascertain the cause before a proper treatment can be adopted.

White discharges are generally found when menstruation is absent, and this is due to the congested state of the sexual organs. When chronic suppression is the result of slow organic disease, such as diseased ovaries, dropsy, etc., it is incurable. It is necessary that an examination should be made by means of the speculum, in order to ascertain whether or not there is ulceration of the womb, ovarian inflammation, or any other like condition, as no proper treatment can be adopted until there is a certainty as to the cause of the suppression. If, after a proper examination, the chronic suppression should be found to be due to ulceration of the mouth of the womb, or inflammation of the ovaries, the cause must first be removed; and after this, should menstruation not return of its own accord, it may be induced to flow again by proper treatment.

Beet Remedy.—The syrup of the beet has been found very efficient in the treatment of gravel and delayed menstruation, when the latter is caused by unnatural conditions, such as colds, etc. The beets are prepared in the following way: Take a bunch of beets with their stalks and leaves (young beets preferable). Wash thoroughly and cut into small pieces. Place in

a kettle and cover with plenty of water. Place the lid on the kettle and let them boil slowly and steadily for about an hour. When thoroughly cooked and soft, press out with a wire potato-masher, and strain the liquor into another kettle. Place this back on a slow fire and boil to the consistency of a syrup. The dose is from one-half to one teacupful two or three times a day, in accordance with the severity of the complaint.

Prevention.—In order to prevent amenorrhea, women should be careful not to expose themselves to cold or wet just before or during the menstrual period. It is true that habit accustoms the system to many abuses, and it is a fact that although some women may take a sea bath while menstruating, without injury, this is the exception and not the rule. During the menstrual period, sexual intercourse and violent emetics or purgatives should be avoided, and thin stockings and thin shoes should not be worn, as they expose the feet and legs to the cold and wet. If these precautions are strictly observed just before and during the menstrual period, chronic suppression of the menstrual flow can doubtless be avoided, and thousands of women spared the misery and intolerable ills and discomforts which it brings.

VICARIOUS MENSTRUATION

Definition.—Vicarious menstruation is a very strange and curious affection which sometimes occurs in the absence of natural menstruation, and has been termed a "freak of nature." It is quite likely that many women have experienced this strange and peculiar circumstance without having been able to understand or account for its appearance, and have also undoubtedly felt greatly alarmed.

Causes.—It is the discharge of a quantity of blood from some other organ, generally the stomach, the lungs, or nose, which takes place periodically at the menstrual periods. Naturally it is the cause of much apprehension to the patient, but it is not dangerous and usually ceases after a while.

Symptoms.—It is sometimes very difficult to distinguish it from true primary hemorrhage, but the guiding and distinguishing facts are the presence of amenorrhea or suppression, the occasional recurrence at the menstrual periods, and the absence of the signs of disorder and disease which accompany primary

hemorrhage. White discharges frequently take the place of absent menstruation, occurring at the usual periods, lasting the usual time, and attended by the usual menstruation effort. This is a very common condition in delicate girls at the beginning of the menstrual period.

Treatment.—The only treatment in vicarious menstruation is to induce menstruation, and therefore a physician should in all such cases be consulted.

PAINFUL MENSTRUATION—DYSMENORRHEA

Definition.—This is a very common disease, and is the cause of intense suffering. In fact, in its most aggravated form, occurring every month, it very closely resembles the pains of childbirth. It causes not only intolerable suffering but very frequently barrenness. It is a disease to which single women are especially liable.

Causes.—The causes which give rise to this distressing and excruciating malady are various. It sometimes exists along with menstruation from puberty, but it generally arises at a subsequent period. In other cases it lasts throughout the entire sexual life of the woman, and ceases at last only by the cessation of menstruation. It frequently comes on gradually, from impairment of the general health, as amenorrhea, but may also be caused by ulceration of the mouth of the womb and ovarian disease.

Symptoms.—Menstruation becomes irregular and is at times excessive, but generally scanty. The discharge is shreddy and clotted, and emitted with excruciating pains in the womb and vagina. Severe pains are also felt in the loins, shooting toward the groin and down the inside of the thighs; expulsatory throes resembling those of labor occur, the patient bears down, and sometimes after the expulsion of a clot experiences a temporary relief. In some cases in which there is considerable congestion of the womb, so-called "spurious abortions' occur; these are membranes containing large clots of blood which are expelled from the womb accompanied by severe pains.

Acute pains in the breasts sometimes precede menstruation for several days; in other cases, headache, flushing of the face, weight on the pelvis, full and quick pulse—all symptoms of in-

flammation which foretell the approaching storm. The menstrual pains in some cases disappear after having continued a day or two, so that the patient is easy and comfortable; while in other cases the pain continues during the entire period of menstruation. The intervals between menstrual periods are often free from pain, and at first only very slight constitutional disturbances occur, but the health becomes gradually impaired, the bowels are at times constipated and at times loose, and there is loss of appetite, pallor, and emaciation. During the menstrual intervals there are oftentimes profuse white discharges; sometimes suppression follows and the breasts shrink and become flabby.

Treatment.—In treating painful menstruation it is necessary, first of all, to discover the cause, as otherwise the treatment is likely to be erroneous and ineffectual. A thorough examination will disclose the fact as to whether or not there is ulceration or ovarian disease, and if these conditions are found, their cure can generally be effected and the dysmenorrhea removed.

Relief, however, is always desired, and as women suffering from this distressing malady naturally desire to employ some means of self-aid, preferring to apply for medical aid only as a last resort, the following directions will be found highly valuable. As soon as the pain has set in, material relief will be afforded by taking a hip-bath at a temperature of 96° F. for from half an hour to an hour, repeating this three times daily, going to bed immediately after each bath and remaining there until warmth has been restored. The menstruation will be considerably eased by taking small doses of ipecac, from two to four drops every hour.

The following has been proved beneficial:

℞ Syrup of Ipecac one-half ounce
Fluidextract of Viburnum.....one ounce
Simple Elixir two ounces
Mix.

Dose: One teaspoonful every three hours until pain is relieved.

Or:

℞ Tincture of Pulsatilla.....one ounce
Dose: Five drops every hour or two, in a little water, until relieved.

Prevention.—Do not neglect even the slightest pain or uneasiness during menstruation, but combat them at the very beginning, lest they become more aggravated. This measure is especially necessary if the pains should not exist along with menstruation but come on later; and should menstruation gradually become more painful, it is an unmistakable sign of a growing disorder.

PROFUSE MENSTRUATION—MENORRHAGIA

Definition.—By profuse menstruation is meant excess of the usual or normal quantity, as well as undue frequency. Two kinds are recognized: in one there is an excessive loss of blood from an abnormally prolonged or profuse menstruation, and in the other a hemorrhage occurs between the periods of menstruation. The latter variety is easily recognized by the presence of clots of blood in the discharge, or by its stiffening the linen, these features not being present in the normal menstrual flow. In the majority of cases, however, this direct uterine bleeding is a marked feature.

Causes.—Profuse menstruation is often caused by the application of cold during menstruation; if the cold should not arrest the discharge suddenly, as it frequently does, it may, on the contrary, cause a profuse flow attended by feverish symptoms, and the habit of profuse menstruation continues at subsequent periods.

As there are many forms of menorrhagia, so there are various causes of it, but the very essence of the disease consists in an over-excited state of the ovaries, which discharge too rapidly immature eggs; also in a congested and irritable state of these organs, as well as of the womb, which gives rise to the profuse menstrual bleeding. It is a wise precaution for women who have married late in life to be very moderate in the exercise of the sexual organs, as immoderate or excessive sexual intercourse is likely to produce menorrhagia. Too frequent child-bearing is another cause, together with protracted nursing.

Abortion frequently causes this disease and is also caused by it. Like the other diseases of menstruation, menorrhagia may be due to ulceration of the womb and inflammation of the ovaries. Cold, especially during menstruation, is another fre-

quent cause, as it produces congestion and derangement of the secreting organs.

Another cause of this disease is masturbation, this practice being an excessive abuse of the sexual organs, which tends more to cause the disease than normal sexual intercourse.

Symptoms.—It is highly important that women should be able to recognize, by certain unmistakable signs, the nature of the malady from which they may be suffering, as in many cases they may be able to help themselves to the extent of obtaining relief.

The flow of blood at the menstrual periods becomes much more profuse than is natural, continuing for several days longer than it should. The menstrual periods are also much closer, so that the menses occur every three weeks and sometimes every two weeks. Thus, in many cases, the woman is almost always menstruating, one prolonged period hardly being over when another begins, and during the menstrual intervals there is usually profuse leucorrhea. In some cases, particularly in women who have borne children, the discharge comes on suddenly in gushes, not like the slow dripping which characterizes the natural flow. At first there is languor and weakness in the loins; then severe aching in the loins and back, coming around to the thighs and groins; acute headaches often confined to one spot, as if a nail were driven into the head; ringing in the ears; dimness of sight and dizziness. Sometimes there is a sensation as if a clock were ticking in the head, increasing pallor and debility, derangement of the stomach and bowels, palpitation of the heart, melancholia and nervousness, at times almost to insanity, dropsy of the eyelids and feet, and sometimes falling of the womb and vagina. If the patient be a full-blooded married woman, it is often of an active and more violent character, while in the delicate (among whom it is much more frequent) it is rather of a passive nature.

Treatment.—A proper treatment of menorrhagia must necessarily be preceded by a careful examination in order to ascertain whether or not there is ulceration at the mouth of the womb or disease of the ovaries. If it be found that the disease is the result of excessive sexual intercourse, frequent abortions, or over-lactation, the cause must be removed; and in the latter case it would be necessary that the child be weaned.

During the passive forms of this disease every possible means should be adopted to brace the general health, and to this end, life in the open air, with cold shower-baths to the loins and lower part of the abdomen, will be found very valuable. Every cause of mental or bodily excitement must be avoided, and sexual intercourse should be either discontinued or be in great moderation.

In active menorrhagia, when the woman is full-blooded, purgatives are highly useful; or, better still, a spare diet and careful avoidance of unhealthful excitement. It is very essential that besides the constitutional means that are to be used during the menstrual intervals, special attention should be given to the restraining of the actual flow. All fatigue should be avoided a few days before menstruation, and the patient should lie in a recumbent posture a great deal, so as to prevent any congestion of the pelvic organs. The recumbent position, that is to say, reclining or leaning backward, is imperative and indispensable, for without it all means will prove futile and ineffectual. This posture should be strictly maintained as the flow begins and continued until the end of the period, as the discharge is continued or renewed by every slight exertion. The patient should be kept cool, and if there be great loss of blood, cold baths should be applied to the vulva or external part of the genitals and over the hips.

The following astringent injection into the vagina should also be used:

℞ Zinc Sulphate one ounce
Tannic Acid two ounces
Mix.
Directions: One teaspoonful in two quarts of warm water, and use as douche, night and morning.

Do not, however, apply the cold at the beginning of the menstrual period, for it is likely to produce a spasm of the womb, but it may safely be applied when the natural secretion seems nearly over and the clots are passed. In some cases, where there is extreme exhaustion, the profuse bleeding must be arrested by every possible means, lest the result be fatal. The best means is the plugging of the vagina with a clean piece of ab-

sorbent cotton, and should this not check the profuse hemorrhage, it is best to call a physician immediately.

The best internal medicine in passive hemorrhagia is ergot: it has specific action on the womb, causing the muscular fibers to contract. The dose of the extract is five grains every six hours, and that of the tincture of ergot, one-half teaspoonful every six hours.

Should bleeding continue, the following prescription should be used:

℞ Fluidextract of Ergot.....one ounce

Dose: One teaspoonful in water every four hours for four doses.

Or:

℞ Oxide of Manganese one-half teaspoonful
Sulphate of Quinine one teaspoonful
Mix, and divide into fifteen capsules.
Dose: One capsule every four hours.

In the case of a full-blooded woman in whom there is quick pulse with spasmodic pain in the womb accompanying the discharge, nausea should be induced by giving one grain of ipecac every hour. This is a most admirable remedy and relieves the pain while it also lessens the flow.

Prevention.—As in most cases of diseases of menstruation, the chief victims of menorrhagia are delicate and irritable women. Excessive sexual intercourse and masturbation must be strictly avoided, and there must be only a moderate degree of sexual stimulus. While robust women can endure frequent pregnancy with impunity, it is a positive danger to the delicate, as well as to those whose mode of life has not been a healthful one.

Over-lactation is extremely weakening to the general health, and especially to the sexual organs. Inflammation of the ovaries is often caused by sudden arrest of the secretion of milk, while an unnatural prolongation of nursing tends to irritate and enfeeble the ovaries. Ulceration of the womb and ovarian disease must be avoided as a means of escaping menorrhagia.

It may be helpful to many women to know that the common

belief that copious menstruation is a healthful sign is erroneous. This mistaken belief very often causes many women to neglect profuse menstruation at the beginning and thus bring upon themselves its great train of attendant miseries. The amount of the natural discharge varies in different women, and each should judge what is natural to herself in health; and should menstruation become more abundant than usual, she should be careful to take the wise precaution not to neglect this indication.

ABORTION

Definition.—This term includes expulsion of the contents of the womb before the fifth month. This is distinguished from miscarriage, inasmuch as the latter is limited to the fifth, sixth, and seventh months.

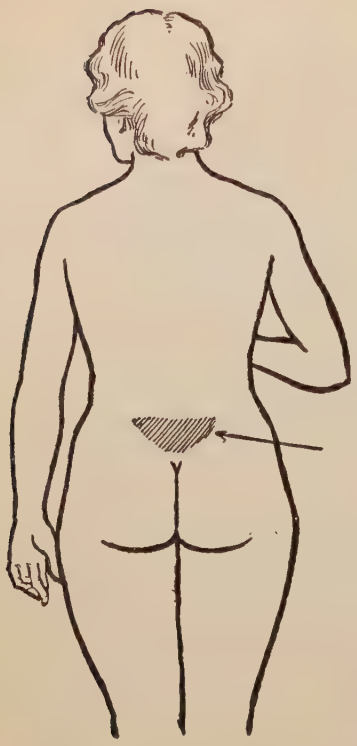
Causes.—Abortion may result from accident, disease of the ovum, or disease of the mother. If an accident is the cause, there is usually a hemorrhage which causes the ovum to flow out. Syphilis is a common cause for continuous abortion. Very seldom does the ovum itself cause abortion. Abortion is usually due to some fault of the mother. If the mother becomes infected with any of the acute fevers, she will usually have an abortion. Laceration of the cervix in many cases prevents the womb from holding the ovum.

Criminal abortion means that the womb was emptied intentionally. This is caused by taking drugs, or opening the womb.

Symptoms.—There is usually a sharp onset of pain, with a gush of blood from the womb. These pains continue and may radiate around the back like labor pains. There usually occurs painful movement of the bowels, with a sense of weight in the pelvis. Occasionally the woman vomits for an hour after the onset of the pain.

Treatment.—The first thing to be considered is to instruct the woman about abortions and find out if she has any disease which may be the cause. If any irregularity in the woman's health is found, she should be treated before another pregnancy occurs.

If an abortion is imminent, that is, if the symptoms are beginning to show, the woman should be put in bed and given a



light diet. Cool drinks, such as lemonade, will be found valuable for relief. A hot-water bag should be placed over the lower part of the spinal column, as shown by the shaded area in the accompanying illustration.

The patient should not become excited or be allowed to exert herself. In order to stop the abortion, the following prescription should be given:

℞ Fluidextract of Viburnum Prunifolium...two ounces
Dose: One teaspoonful every three hours, in water.

The patient should be kept in bed after the abortion for about three days. A good, nourishing diet should be given, with plenty of fluids. Vegetables and fruits may be allowed but meats should be restricted. The vulva should be kept clean and fresh pads applied at least twice each day. After the third day the patient should take a douche of warm salt water, night and morning. If, after the fourth day, the womb still bleeds, the following prescription will be beneficial:

℞ Fluidextract of Ergot one ounce
Dose: One teaspoonful night and morning, in water.

This medicine should be discontinued as soon as the bleeding ceases.

CHLOROSIS—GREEN SICKNESS

Definition—Chlorosis is a form of anemia, the chief characteristics of which are a marked reduction of hemoglobin in the blood and a slight diminution of red corpuscles. It is generally found in young girls at the age of puberty, but may also occur at

any age during the continuance of menstruation. It is occasionally found in married women who have been exhausted by miscarriages, over-lactation, and a variety of other conditions. It very rarely, if ever, occurs before puberty or after the menstrual decline, and is therefore to be connected with the sexual system.

Causes.—An examination of the causes of this destructive malady is of unusual value to any mother whose daughter may be fortunate enough to escape the deadly inroads which it is likely to make into her health if proper and effective precautions be taken. It may prove the salvation of many a young girl who would otherwise fall an easy victim to its ravages because she is unfamiliar with the insidious ways in which it invades the unprotected system. The general and prevailing education of young girls is largely responsible for this malady owing to the conventional ideas as to just what is proper for young girls. The erroneous views that prevail in educating a young girl as to what is admirable and beautiful in a female character, bring her up weak in body and mind; her strength is not fully developed by sports and suitable exercise, and she is consequently feeble and delicate; her courage is not cultivated but suppressed, so that she becomes nervous and hysterical. By the cramping and enfeebling training that many girls receive in early youth, they grow up so delicate that their constitution is too undeveloped to arouse to life and to give adequate vital energy to the new set of organs at the age of puberty.

Some girls are not strong enough to lose three or four ounces of blood each month, through menstruation, nor have they the necessary excess of vital powers required for the reproduction of the species, for which privilege nature demands a certain amount of vigor. This delay in the evolution of the sexual organs at puberty reacts on the blood, which, owing to the lack of the new nervous influences which the frame should receive at such a time of life, becomes impoverished and causes the series of symptoms of chlorosis to develop.

Symptoms.—These can be recognized in the following conditions: a girl who has been more or less delicate approaches the age of puberty, and instead of increasing in strength and vigor, coincidently with the natural development of the sexual organs, deteriorates in health and becomes more delicate. The sexual system either does not develop at all or only imperfectly, and

menstruation, which should follow, is insufficient or absent entirely.

The disease may sometimes arise after puberty and with menstruation well established, from causes which have weakened the general health, and especially from such as interfere with sexual functions. The patient grows pale and sickly, a death-like pallor being characteristic of this disease. There is loss of appetite; the strength declines so that slight exercise produces fatigue; there is palpitation of the heart and breathlessness; the stomach becomes disordered, digestion difficult, and constipation is generally present. There is flatulence, heartburn, and frequently a total absence of appetite, and at other times a craving for unwholesome food, such as green fruit—even chalk, slate-pencils, etc. The tongue is pasty, the breath foul, and the pallor becomes more pronounced, so that the face has often a dirty, greenish-yellow hue; from this the disease derives its name. The lips and gums are pale and bloodless; headaches of fearful intensity are quite frequent, the pain or feeling of weight and pressure being confined often to the top of the head. The senses are impaired; sight and hearing are weakened; the mental powers are greatly impaired; memory and the power of concentration fail and the patient develops hysterical symptoms. In short, every function of the body and mind is more or less interfered with; they all become enfeebled, because the blood from which all these organs derive their nourishment is itself impoverished.

Chlorosis consists essentially of a watery state of the blood, which, in this disease, is found to have lost a great part of its solid constituents. The individual clots are very small and dark-colored, and on standing separate from the watery part. This watery condition of the blood causes the death-like pallor and extreme debility, the arrest of the menstrual flow, and failure of the bodily and mental powers.

Treatment.—The treatment of this wretched malady is based on the great principle of bracing and elevating the constitution and of rendering the blood richer. If this can be effected, the whole train of disordered symptoms will disappear, the skin will regain its hue, the mind its tone and buoyancy, and puberty and menstruation will be thoroughly established. The patient should be sent into the country; she should be constantly in the open air and take as much exercise

as can be borne without fatigue. She should take a cold or slightly tepid bath every day, applying the cold water for a very short time, following this with a brisk rub-down with a Turkish towel and taking a walk before and after the bath. She must keep regular hours and live on a nutritious diet. The medicine which is chiefly relied on in this disease is iron, the effect of which in enriching the blood and invigorating the frame is often so marked that it is considered by many as a specific in chlorosis. Its beneficial effect is increased when given in connection with the natural stimulants, such as pure air and proper and adequate exercise.

The following tonics have been proved very beneficial:

℞ Blaud's Iron Pills, freshly made.....five grains
Dose: One pill three times a day, half an hour after meals.

Or:

℞ Syrup of Iron Iodide one ounce
Dose: Fifteen drops in a little water, directly after meals.

Or:

℞ Elixir of Iron, Quinine, and Arsenic ..three ounces
Dose: One teaspoonful three times a day, half an hour before meals.

It is important that the bowels be cleaned out thoroughly before starting in with the iron treatment, and the following purgative is considered very effective:

℞ Compound Licorice Powder.....two ounces
Dose: One tablespoonful in a glass of water, each night before retiring.

It is preferable, however, whenever possible, to regulate the bowels and reinvigorate the digestion by more natural means, such as country air, exercise, bathing and other hygienic means so beneficially applied by the hydropathic treatment, applying the cold water for a short time and following by strong friction. Iron should never be given in chlorotic cases until there is an improvement in the digestion and appetite and the tongue is cleaner.

In order to prevent this dreadful disease, every possible means must be employed to elevate the physical powers in woman, be-

ginning with childhood. It is not for themselves alone that they should elevate their bodily powers, but for their future offspring also. A chlorotic mother will usually bear pale and sickly children.

When a girl has been trained to the possession of a powerful and healthy frame and a healthy mind invigorated by sound knowledge for her guidance in life, puberty will be readily and easily established, menstruation will follow, and she will enter upon the period of womanhood with the brightest and fairest prospects of happiness.

LEUCORRHEA

Definition.—Leucorrhea is not a disease of itself, but a symptom of the various female disorders. When the generative organs are in perfect health, there is a constant secretion of mucus from the entire genital tract, but sufficient only to lubricate the parts. It is only when the secretion becomes excessive, or when there is an abnormal discharge of mucus, pus, etc., from the vagina, that it is termed leucorrhea, or "the whites."

Causes.—There are various causes to which this important malady may be attributed. It is most common in those who have borne children, for the reason that after childbirth the womb does not entirely return to its original size; it is somewhat larger and more sensitive; the vagina is also more relaxed and more liable to congestion and inflammation than in the virgin. Moreover, abortion and childbirth are in many cases followed by inflammatory diseases of the mouth of the womb, which give rise to leucorrhea. It is important to bear in mind that the more the vitality of any organ is weakened, the more liable it becomes to inflammation.

Sexual excesses may cause leucorrhea; various diseases of menstruation are also generally accompanied by this malady. Leucorrhea may be caused by cold and the wearing of insufficient clothing. The monthly congestion of the sexual organs and the unnatural and sedentary life which many women lead intensify the disease, so that once established it is very difficult to cure.

In Children.—The chief cause of the whites in children is an inflammation of the vulva or lips of the external genitals, which

are red and swollen and covered with the white discharge; it rarely extends to the vagina itself. The sebaceous glands not being as yet developed, the discharge is serous, or composed of serum and pus. It is due to uncleanliness, worms, gonorrhea, chilling, masturbation, etc., and may follow scarlet fever, smallpox, and other diseases.

Symptoms.—The symptoms consist at first of irritation and itching; there is smarting or scalding on passing water; later, there is a thin, colorless mucous discharge, which increases in quantity and becomes thicker.

Treatment.—The treatment is, of course, the removal of the cause, and to bathe the parts, in order to keep them clean, with antiseptic and astringent solutions. If the inflammatory condition is neglected, extension upward occurs, with closure due to adhesion of the vagina and the tubes, leading to permanent sterility; and when puberty arises, the menstrual discharges will not find an exit, causing a tumor due to the collecting blood, and peritonitis and death may follow.

In Virgins.—A slight discharge is common and natural, but when persistent and profuse it is not normal, and among unmarried women it is very often neglected, the trouble not being taken to have it cured. It occurs in the run-down and anemic.

Causes.—When it is accompanied by profuse menstruation with pain, it is due to pelvic congestion, too much blood in the womb and the circulation in it being impaired; this may be due to too much prolonged standing and hard work.

Treatment.—The treatment consists of rest in bed during the periods, plenty of sleep, tonics, and fresh air, and also vaginal douches of antiseptic and astringent solutions. (See page 89.)

In Married Women.—The profuse white discharge usually makes its appearance shortly after childbirth, due to injury during delivery, or getting up from bed too soon or resuming household duties too early.

Causes.—It may be due to an erosion on the mouth of the womb or inflammation of the womb. Gonorrhea is a frequent cause, and a dangerous one. Leucorrhea is present in the married woman in any condition of inflammation of the vagina, or ulcers of the vagina and mouth of the womb, being chiefly due to lacerations which have not healed; if neglected, it may be necessary to remove the mouth of the womb and the diseased tissues by an

operation. It is also present in polyps of the womb, or in any tumorous condition of the womb, as fibroids or cancer. In all cases of displacement of the womb the attending inflammation brings about an increased secretion and the whites. Metritis and endometritis are nearly always accompanied by leucorrhea.

Treatment.—The treatment depends on the removal of the causes, which, as stated, are numerous. (See page 89.)

In Elderly Women.—In aged women it always means that there is a diseased condition present; this may result from inflammation, due either to a pessary being worn that does not fit properly, or to gonorrhea. If due to uterine diseases, one must always bear in mind the tendency, at this period of life, to tumors and cancers.

Symptoms.—The discharge is caused by an inflamed or congested state of the mucous membrane of the vagina, the vulva, or the womb. The symptoms of an acute attack are a feeling of heat and tenderness in the parts, followed by a mucous or mucous and pus discharge. There is also a scalding sensation in passing the urine and a more or less feverish reaction. The pain, heat, and scalding disappear after a time, but a copious discharge continues; in this chronic state the disease tends to become very obstinate and to considerably exhaust the strength of the patient. The pain, heat, and scalding last indefinitely in a subdued form, but are very easily excited again.

When leucorrhea and other inflammations of the female sexual organs become chronic they are very obstinate and hard to cure. This is partially due to the periodical return of menstruation, which congests these organs, so that at every monthly period the flame of their inflammatory diseases is rekindled. Leucorrhea, when once established, will often last for a period of years and gradually cause the most serious impairment of the health. The constant drain breaks down the system, produces pallor, debility, pains in the back, palpitations, dyspepsia, and other similar conditions. In the young, leucorrhea has a tendency to induce chlorosis, absence of menstruation, and consumption. Falling of the womb and ovaries and also barrenness are often the consequence of this malady. In most cases the disease is of a rather mild nature, causing only a minor amount of weakness and pallor. It is the misfortune of many women to be constantly afflicted with this malady. There is probably no other disease so neg-

lected; in fact, many women only seek the aid of the physician when the malady has become exceedingly aggravated.

At times the discharge is very copious, soiling several napkins a day; at other times it is less abundant but very acrid, causing excoriation or rubbing off of the skin of the lips of the vulva and the inside of the thighs. The discharge varies in color and nature, being sometimes actually colorless, while in other cases it is yellow, due to pus; or it may be muco-purulent; in other words, it is a mixture of the two characters. Pus is always a sign of inflammation, as there cannot be any pus without inflammation being present. The flow of muco-purulent secretion is due to a minor state of inflammation. Pure pus is seldom discharged in abundance from the female genital organs except in infectious diseases, when large quantities are formed. The flow of colorless mucus may be due to congestion without inflammation being present. A white curdy matter which is sometimes seen comes from the mucous follicles on the neck of the womb when the latter is merely congested; whereas a peculiar glairy, transparent mucus like white of egg comes from the follicles inside the cervical canal; this latter is a sign of inflammation.

The natural mucus which moistens the passages is never enough to constitute a discharge in a perfectly healthy person, but in many women this secretion is considerably increased for a day or two before and after menstruation, so that in some cases it forms a discharge. This over-secretion, although it has little effect on the health, is a sure sign of a congested state of the parts. This congestion may be readily increased by various causes and give rise to a permanent discharge which leads to inflammation.

Leucorrhea is severe and obstinate in proportion to the extent of the mucous surface affected. In many cases the disease is confined to the vulva, and in such cases it may be readily cured, while in severe chronic cases the whole of the vagina is generally involved and further complicated by ulcers of the womb and inflammation of the cervical canal.

Treatment.—Women suffering from leucorrhea should adopt treatment early, for if the first signs be disregarded or neglected, the disease will take firm root in the system. No woman should allow symptoms of discharge or inflammation to exist for the

shortest period without at once taking the proper means to remove them.

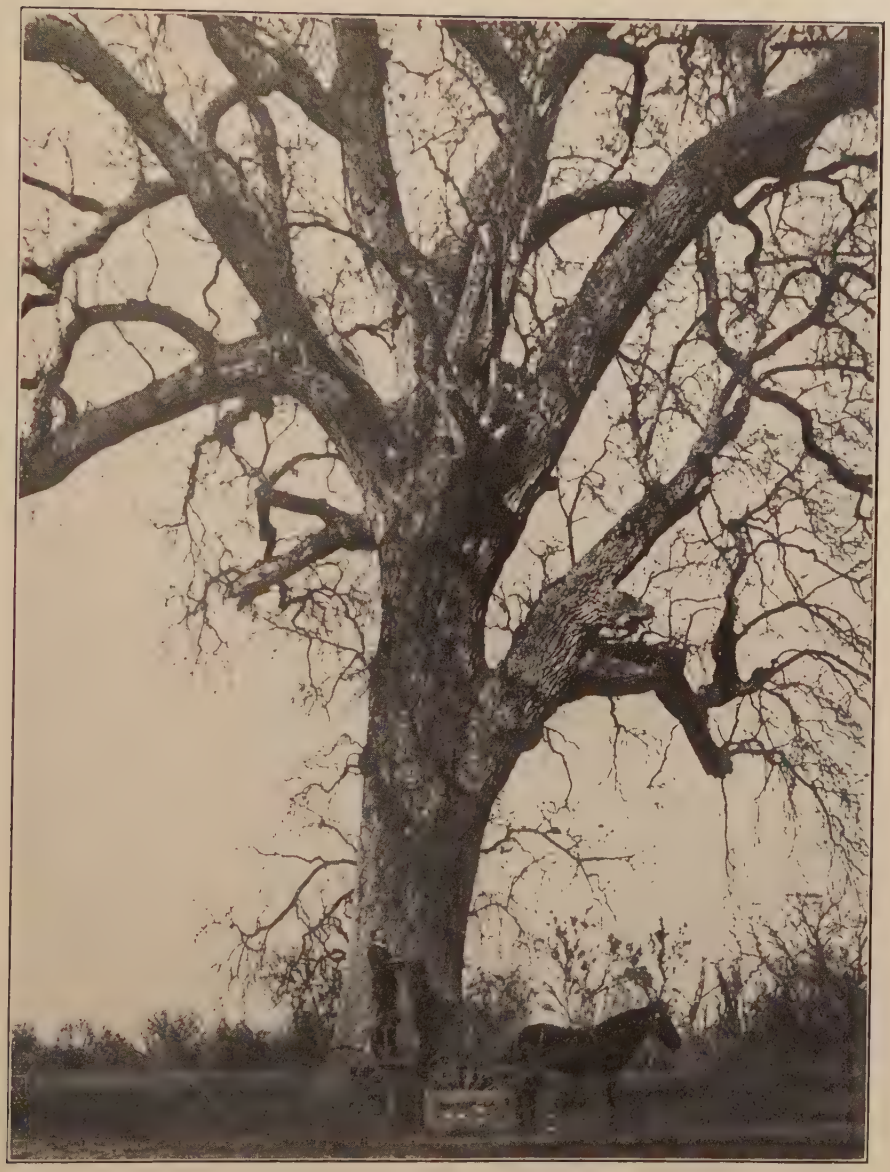
In acute leucorrhea, in which there are heat, tenderness, and acute inflammation, the treatment should be mild and soothing: rest; a mild laxative; washing with tepid water; together with avoidance of late hours, sexual intercourse, and other excitement. By these measures the attack will generally speedily subside, but if it should not and the discharge should become chronic, the best treatment is astringent injections into the vagina, which, if well done and assisted by a regular mode of living, will generally give relief.

Injections, however, frequently fail to give the best results because they are not properly used. The vagina is a long canal, and unless the injection reach the whole of the surface affected, a sure treatment cannot be effected. It is therefore highly expedient that the following directions be observed in giving injections: support the hips by means of a hard cushion, and place beneath the patient a flat bed-pan; inject about a pint of the liquid at a time and retain it for five or ten minutes by means of a napkin.

At first the injection should be used twice a day, but after three weeks' treatment two or three times a week will be sufficient. If one kind of lotion should fail, try another; in fact, it is sometimes very beneficial to vary them at intervals. After a cure has been effected, it is advisable to inject cold water once or twice a day, for sometimes it acts as a tonic and restores tone to the parts. It is the opinion of many medical men that the ablution or washing of the external genitals with cold water is not in the least harmful but highly beneficial. The injection of a few ounces of cold water into the rectum every day is also strongly recommended in obstinate cases of leucorrhea where the discharge is limited to a few drops.

A very excellent remedy in obstinate cases is plugging the vagina with absorbent cotton, which absorbs the moisture as it flows and keeps the mucous surfaces apart. The absorbent cotton is rolled in a ball and tied around with a piece of tape. This is easily inserted and can be removed conveniently by pulling the tape. The surfaces of the vagina, if touching, act just like poultices to each other, causing continuance of the discharge.

In many cases leucorrhea is caused or encouraged by ulcers of



WHITE OAK BARK

The bark is the best known remedy for leucorrhea. It seldom ever fails in the treatment of this complaint. This bark can be procured at any drug store.

See page 89

the womb, and if these are not treated injections will be of no service. In all obstinate cases of leucorrhea an examination should be made, in order to ascertain if ulcers are present and to determine how high the disease has reached in the vagina. When leucorrhea is connected with diseases of menstruation, these must first be cured before it can be subdued. In addition to the local means, the general treatment is of very great importance. Avoid sedentary habits, heated rooms, and all stimulants; live as much as possible in the open air; take cold baths, the cold shower over the loins, the cold sitz-bath; and strengthen the frame by moderate exercise. Without these constitutional means, local treatment will frequently fail in obstinate cases. It is also quite necessary to persevere for some time with the remedies, for the disease is very slow to yield, and unless it be thoroughly cured a relapse is likely to occur.

As in many cases anemia is present, great benefit will be derived from the following mixture:

℞ Compound Tincture of Cinchona two ounces
Compound Tincture of Gentian two ounces
Mix.
Dose: One dessertspoonful three times a day, after meals.

The following prescriptions used as a douche, in the morning upon arising and at night before retiring, must be continued for a period of at least three weeks; and then two or three times a week for a few months, even if all symptoms have apparently disappeared:

℞ Common table salt two teaspoonfuls
Bicarbonate of Soda two teaspoonfuls
Borax two teaspoonfuls
Water (hot as can be borne).....two quarts
Directions: Use as a douche.

Or:

℞ Powdered White-oak Bark two teaspoonfuls
Boiled water two quarts
Add powder to hot water, and when cool strain through gauze.
Directions: Use full quantity as douche each morning.

If it is not possible to get the powdered bark, use the same amount of tannic acid, which is extracted from the bark of the white-oak tree, and can be procured from any drug store.

Or:

℞ Sulphate of Zinc one dram
Sulphate of Alum one dram
Glycerine six ounces
Mix.
Directions: Use one teaspoonful of above mixture to each quart of water (hot).

Or:

℞ Tannic Acid one-half ounce
Glycerine one ounce
Water (hot as can be borne) two quarts
Mix.
Directions: Use as a douche.

Or:

℞ Acetate of Lead one-half ounce
Water (hot as can be borne) two quarts
Mix.
Directions: Use as a douche.

Or:

℞ Bicarbonate of Soda two drams
Tincture of Belladonna Leaves four drams
Water (hot as can be borne) one quart
Mix.
Directions: Use as a douche.

The following mixtures are very valuable douches in cases where there is an offensive odor to the discharge:

℞ Creolin one-half dram
Water eight ounces
Mix.
Directions: Add four tablespoonfuls (two ounces) of this solution to a quart of hot water.

Or:

℞ Permanganate of Potash one-half teaspoonful
Water (hot as can be borne)..two quarts
Mix.

A tampon (pledget of absorbent cotton) thoroughly saturated with equal parts of powdered iodoform and tannic acid and packed around the neck of the womb is of service in checking the discharge.

Prevention.—In order to prevent this wide-spread affection, the same rule can be applied here as in so many other disturbances of the human system, and that is, to prevent such actions as will encourage the cause. Frequent childbirth and prolonged nursing are almost sure to bring on leucorrhea, unless the physical condition and the circumstances of the woman are such as to enable her to endure the strain. Leucorrhea is a weakening malady, and whatever tends to produce debility should be avoided. Sedentary occupations are a contributory cause; there are few modes of life so unhealthful as those of the seamstress, milliner, typist, bookkeeper, and others of close confinement, the want of suitable exercise rendering them peculiarly liable to the disease. Those afflicted with the disease must bear in mind that there is great risk and danger in neglecting the first stages. Strict and prompt attention should be given to the habitual excess mucous secretion before and after menstruation, so that it may not be permitted to continue.

HOW TO USE THE DOUCHE OR VAGINAL INJECTION

Purpose of the Douche.—In order that a woman may understand the use of douching, she must first thoroughly understand the purpose of the douche.

The neck of the womb protrudes a little into the vagina, and the wash merely bathes the walls of the vagina and the neck of the womb. In order that all the parts may be reached, the person must stand up and bend the body slightly forward.

If the woman sits down, the vagina doubles on itself and prevents the thorough circulation of the wash.

Any ordinary douche is not meant to be retained; that is, the douche is kept in continuous flow. In order to attain this purpose, the woman presses her hand on the back wall of the vagina; in this way a passage is formed for the return flow of the fluid. If the heat and medication of the douche is to be absorbed, it is not necessary to let the liquid flow out quickly, and in this latter method it flows out on the sides.

Method.—There are many varieties of syringes recommended for washing out the vagina. Practically there are only two types of syringes, the fountain syringe and the bulb syringe.

The fountain syringe is an essential for every household, because by changing the rubber tip many uses can be made of it. This form of syringe consists of a soft rubber bag, a long rubber tube, and a series of rubber nozzles or tips. The largest of the rubber tips is used for the vagina. It may be curved or straight; this is not very important, because it is merely a matter of convenience. The bag is filled with the injection fluid and held about five or six feet high. Usually there is a valve on the outside of the rubber tube to control the flow. The latest improvement of the fountain syringe is where the rubber tube can be removed and the bag used for a hot-water bottle.

The bulb syringe, commonly called a "whirling spray," consists of a large round rubber bulb with nozzle attached to it. By squeezing the bulb and placing the nozzle in the wash, the fluid is drawn up into the bulb. The tip is inserted as before, and the flow is controlled by squeezing the bulb. It is necessary to fill the bulb about three or four times.

Hints about the Method of Douching.—Ordinarily, a douche should not inconvenience a person very much. Many people find the douche to be very painful because they do not understand the method. First, the bag should only be placed a little above the head. The flow should begin slowly and gradually increase.

An important thing in douching is the insertion of the nozzle. This should never be put in forcefully. Sometimes the muscle will contract and the woman has to endure pain to insert the nozzle. If this occurs, merely wait a few minutes and relax the lower part of the body; this releases the muscle and the nozzle can be inserted without pain. If, after a few minutes, the nozzle cannot be inserted, rub a little vaseline over the tip.

If the douche is to be given in bed, a large and capacious douche-pan will be necessary, one in which the buttocks rest on top and keep the organs in a normal position.

Never use a strong antiseptic solution as a douche, because it will be found very harmful to the parts. It causes such a shrinkage of the mucous membranes that the parts will be painful for days.

Always mix the drugs to be used in a douche before putting the liquid in the bag, because it is impossible to thoroughly mix the fluids when they are in the bag.

Always have the douches lukewarm, unless the doctor advises differently.

If, by accident, the solution was used too strong and the parts are painful, take some vaseline on the fingers and rub this on the inner walls of the vagina.

DISPLACEMENTS OF THE UTERUS

The uterus, or womb, has great freedom of movement up and down and from front to back, being slung in the center of the pelvic cavity. It stands naturally, its long axis being directed upward and forward between the bladder and rectum; its position, however, varies considerably owing to the state of distention of any one of these organs. A bend upon the organ itself may be produced owing to a flabby state of the muscular wall of the uterus or a contraction of some of the ligaments which suspend it, or it may be permanently tilted forward or backward. Bending forward is known as anteflexion; tilting forward is called anteversion; and the corresponding conditions toward the back are termed retroflexion and retroversion. Two objects are kept in mind in treating these conditions, the one being to diminish the inflammation which always accompanies such a condition, and the other, to support the uterus in its proper position by means of a suitably shaped instrument called a pessary; however, should the displacement be very marked, an operation is the only permanent means of correcting the displacement.



Normal position of the womb.

Prolapse is the term applied to downward displacement, the uterus slipping bodily downward in the space between the bladder and the bowel until, in extreme cases, it may protrude from the vagina. It is a condition which develops in elderly women, usually those who are becoming stout, as well as those who have a large amount of physical work to do and who have in childbirth suffered laceration of the parts that should support the uterus.

PROLAPSE OF THE UTERUS—FALLING OF THE WOMB

Definition.—A full and intelligent understanding of this important and peculiar condition would seem to justify a brief description of it. The womb is pear-shaped, flattened from before backward; it is from three and a half to four inches long; one and three-quarter inches wide at the top, terminating below in the neck, which is about an inch across, its entire weight being normally about one ounce and a half.

Its location is in the pelvic cavity, or lower part of the abdomen, between the bladder, which is in front, and the rectum, which is back of it, being supported in its position to a partial extent by resting on the upper end of the vagina and by four ligaments which act as stays. These ligaments are about two and a half inches in length, being specifically for the purpose of maintaining the womb in its normal position. The womb when it sinks downward is said to fall. The sinking when very slight may escape notice, but it sometimes is so considerable that the womb will protrude between the legs through the external opening of the vagina.

Causes.—In connection with this condition, an important feature is that a married woman is more liable to it than a single one, the reason being that the weight of the womb is likely to be increased by congestion, enlargement, or laceration of the perineum.

Prolapse of the uterus is not a disease of the womb itself, but of some of its stays or supports. As long as the normal size of the vagina and the natural length of the ligaments are unchanged, there will be no displacement of the womb, and therefore the disorder is caused primarily by whatever tends to lower the tone of the system from relaxation and debility. Should the

muscles of the abdomen supporting the intestines become weak, there will consequently be pressure of the intestines on the womb and its ligaments, which continual pressure will result in the ligaments or props giving way.

A frequent cause of prolapse of the uterus is exertion too soon after childbirth; and should flooding and leucorrhea be allowed to continue for a prolonged length of time, it will result in falling of the womb. With slender and delicate women, prolapse is likely to result from running up and down stairs; also from dancing, tight lacing, leaping and running (particularly during the menstrual period, when the weight of the womb is increased by the blood it contains).

Symptoms.—The symptoms which accompany this disorder are well marked, and vary according to the extent of the displacement. A more or less bearing-down or dragging sensation is felt in the lower part of the abdomen, with dull pain in the small of the back; a sense of fullness around the rectum, with pressure low down toward the private parts. These sensations are increased by leucorrhea and exercise and continuous standing on the feet, and much relief will therefore be secured by lying down. Pain and a dragging sensation in the groin are also experienced, extending down the thighs (occasioned by pressure on the nerves). There is a desire to urinate, the patient being often unable to do so except by drops, which are quite hot; there is also a pressure about the rectum, which the patient mistakes as an indication to evacuate the bowels. Owing to the pain in the back being at times so intensely distressing, the patient is obliged to throw her body forward or to support herself by placing her hands upon the thighs, in making an attempt to walk. The greatest relief, however, is experienced when lying down, and this indicates clearly the presence of the disease.

Constipation, headache, a dragging pain in the nape of the neck, distressed expression of the countenance, pain in the left side, dyspepsia, and palpitation of the heart are present.

Treatment.—There is a very prevalent idea among women that the cure of this disease depends upon their wearing some sort of a support for the abdomen, which is a mistaken idea. Abdominal supporters, as a matter of fact, tend to increase the pressure on the bowels, which pressure forces the womb and its attachments farther down. In order to correct the condition, it is neces-

sary to raise the womb up to its natural position and employ an instrument which will retain it in such position. This instrument is called a pessary, and consists of a ring, or hollow, cup-shaped globe made of gold, ivory, wood, or hard rubber; it is placed in the vagina and holds the womb in its correct position. Should the perineum be lacerated, the laceration should be sewed, otherwise the pessary will not remain in proper position. Before retiring at night, the pessary should be removed and should be replaced in the morning before getting up.

Should relaxed or weakened supports result in falling of the womb, constitutional means such as tonics should be resorted to, and the following tonic will be found a very beneficial one:

℞ Syrup of Orange Peel four fluid ounces
Compound Tincture of Gentian ..two fluid ounces
Mix.
Dose: Two teaspoonfuls in a wineglassful of water, three times a day, before meals.

In event of the increased size and weight of the womb causing it to hang too low down in the cavity of the pelvis, it will be necessary to treat the inflammation which is present at the same time, in order to reduce the size and weight of the womb. One of the causes of the sagging or bending of the womb is laceration or tearing of the vagina during labor, and this condition must be corrected by stitching.

Beneficial effects are produced by a hip-bath once or twice a day, and at the same time injections of lukewarm water into the vagina. It is also advisable to lie down as much as possible and avoid fatigue. Other means of relieving the condition are applying cold bandages to the abdomen when going to bed, wearing loose clothing, and avoiding the use of corsets and heavy skirts. Moderate exercise in the open air is very beneficial, and the use of electricity is highly recommended. The diet should be plain, nourishing, and easily assimilated.

ANTEFLEXION OF THE WOMB

Definition.—This is a bending forward of the womb. The angle where it bends is just above the cervix, and the body of the womb is placed on the bladder. Normally, the womb is placed

slightly forward, but when the neck becomes weak the bending is exaggerated and the condition called anteflexion. There are many varieties of anteflexion, and this depends upon the age of the person and her physical strength. During early childhood the uterus is naturally more anteflexed than is the case in the adult. If this condition is exaggerated after puberty, the womb is considered out of position. Ordinarily, the walls of the uterus, about the time of puberty, become thick, denser, and consequently stronger. If development takes place symmetrically, the uterus straightens itself, but if the posterior wall develops more than the anterior wall, the latter will fall forward.

Causes. — Anteflexion often develops in delicate, ill nourished girls about the time of puberty. Tight lacing and the suspension of heavy skirts from the loins also tend to force the intestines downward and backward; this presses the uterus forward. A fibroid tumor of the uterus always causes an extra weight, pulling the uterus forward.



Anteflexion of the womb.

Symptoms. — The menstrual flow may be small in amount or altogether absent; however, in some cases the flow is excessive and very painful. As the womb becomes more congested, these symptoms increase with each successive period. These symptoms may develop in a woman after marriage because of mechanical violence, or else owing to shortness of the vagina. After marriage, the menstrual flow clots more easily and the weight of the clots may cause the womb to fall forward. Together with this, the patient becomes nauseated and has attacks of fainting. The patient is relieved by the outflow of blood which has collected in the body of the womb. This condition of sudden hemorrhage, with fainting, may

be repeated for several days. Occasionally, the odor of the flow becomes very offensive because of the stagnation.

Together with the above symptoms, the patient has a pain low down in the abdomen and a frequent desire to pass urine. It is also characterized by increased pain on standing or walking. Leucorrhea is generally present late in the condition. Some women become sterile because of the severe anteflexion of the womb.

Treatment.—The cure of anteflexion is one demanding a great deal of patience by reason of the many causes. In single women, rest in bed, especially at the menstrual periods, and the use of an astringent douche for two days after the flow will often give relief.

The following injection is recommended:

℞ Sulphate of Zinc four ounces
Directions: One teaspoonful in two quarts of water, and use as a douche.

For long standing cases, or in women who have borne children, the insertion of a pessary is the only cure. In a rare form of anteflexion, no treatment can be given; the only cure is by an operation.

ANTEVERSION OF THE WOMB

Definition.—When the womb falls over on the bladder, a peculiar displacement occurs, the top of the womb being tipped forward, pressing against the bladder and intestines in such manner that its arteries, veins, and nerves become affected to such an extent that they become sensitive and painful.

Causes.—Confinement, miscarriages, prolapse of the vagina, tumors, laceration of the pelvis, leucorrhea, congestion, and falls are the chief causes of this condition.

Symptoms.—Among the symptoms noted are frequent miscarriages, leucorrhea, sterility, dragging pains in the abdomen, dysmenorrhea, and constipation. Should the displacement be very great, it presses against the bladder, resulting in irritation and a general distress, and may eventually cause inflammation of the bladder.

Treatment.—Beneficial effects have resulted from the use of the following injection:

℞ Boracic Acid one tablespoonful
Salt two teaspoonfuls
Hot water two quarts
Mix.
DIRECTIONS: Use as a douche, night and morning.

Should pain accompany menstruation, a teaspoonful of fluid-extract of viburnum two or three times a day will be found very effective.

It is, however, more satisfactory and advisable, in cases of anteversion, to have the womb replaced and kept in normal position by the use of a pessary, as referred to in the article relating to prolapse of the uterus.

RETROFLEXION OF THE WOMB

Definition.—In retroflexion the top of the womb is pressed over backward, doubling upon itself and producing a sharp angle on its axis, resulting in a very painful condition.

Causes.—Among the prominent causes are dilatation or expansion of the bladder, pregnancy, the prolonged wearing of a binder after childbirth, tumors, lacerations of the perineum, lack of sufficient care during delivery, blows, and falls.



Retroflexion of the womb.

Symptoms.—Dragging pains in the thighs and lower part of the abdomen; painful menstruation on the first or second day of the flow; a dull aching pain in the small of the back; leucorrhea; abortions; costiveness with occasional pain while evacuating the bowels; escape of the urine from violent emotion, such as a burst of laughter.

Treatment.—Should the displacement of the womb be due to inflammation, a surgical operation is the best means to be adopted. The inflammation should first be removed, if possible, by local treatment, such as warm injections into the vagina. Should retroflexion be due to costiveness or leucorrhea, proper action should accordingly be taken to remove the cause, but the uterus must be restored to its normal position as the first step in treatment.

It is essential, as a precautionary measure, should a pessary be used to maintain the womb in its proper position, that it be removed and cleansed frequently. A salt solution or boracic acid solution (lukewarm) should be injected into the vagina daily while the pessary is worn. It is important that the pessary should be adjusted and fit in such perfect manner that there is no feeling of discomfort or pain upon rising or sitting down. If sufficient relief should be afforded by the pessary in retaining the womb in its natural position, with no discomfort experienced from its use, it is not at all necessary to consider having a surgical operation performed.



Retroversion of the womb.

RETROVERSION OF THE WOMB

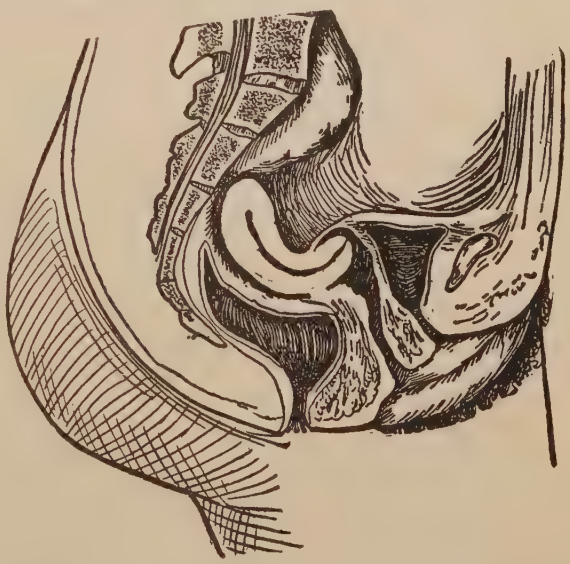
Definition. — When the womb is tilted backward between the rectum and the vagina, without curvature of its axis, such condition is termed retroversion and is the direct opposite of anteversion. Should the retroversion be sudden, considerable discomfort and pain are occasioned; but if the organ be restored to its natural position, which should be done at once,

relief is generally afforded. Should the displacement occur gradually, however, there will be less distress and less severe pain.

Causes.—Carelessness during confinement, continuance of the use of the tight abdominal binder too long after confinement, tumors, pregnancy, lack of muscular support, laceration of the pelvic floor, falls, and tight clothing are among the chief causes.

Symptoms.—Frequent miscarriages, leucorrheal discharges, dysmenorrhea, frequent pains in the lower part of the abdomen, headache, and constipation.

Treatment.—There is a similarity in the treatment for retroversion of the womb to that for anteversion, as in each of these cases the patient should wear a pessary to hold the womb in its natural position and in order that the ligaments which support it may adjust themselves.



Anteflexion with retroversion.

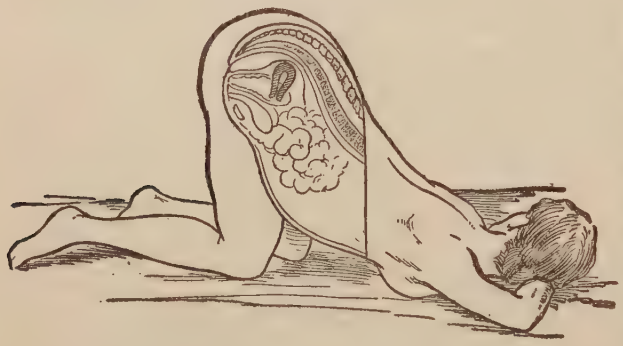
PESSARIES

An important thing to remember is that while in some cases of prolapse pessaries are very serviceable and beneficial, they often have an injurious effect on the health, as the pressure on the ovaries and tube may cause inflammation; they often cause the ligaments of the womb to stretch to a considerable extent and cause the vagina to relax or loosen, thereby increasing the inflammation and causing displacements. Sometimes, however, they render valuable service, affording material relief from discomfort and uneasiness by keeping a slightly misplaced womb in its normal position.

Pessaries should never be used until a physician has been consulted, as each different position of the uterus, and, in the ma-

jority of cases, each individual woman, requires a definite form and size. Furthermore, pessaries must be fitted so as to render little or any pressure on the tubes, ligaments, and surrounding tissues, otherwise by this pressure inflammation will surely follow.

By placing the patient in the position as shown in the following illustration, the thighs being directly vertical to the surface on which she kneels, the body inclined on an angle of about forty-five degrees, will tend to swing the womb around from the back to its natural position. In this position, the abdominal muscles become relaxed and air is admitted to the vagina, the atmospheric pressure enabling the womb to recede and thus regain its natural position, as is shown by the next illustration. However, should reduction not take place, the finger may be used to press the fundus downward and forward during a prolonged expiration.





STERILITY—BARRENNESS

Many women are subject to this unfortunate condition, through no fault of their own in some cases, while in other cases the victims of this misfortune are not entirely blameless.

It is absolutely necessary, in order to understand intelligently the real nature of sterility, that a fair knowledge be obtained

of the main factors which influence and make conception possible.

First, the female ovum, or egg, must be impregnated by the male germ; second, the male germ must gain entrance into the cavity of the womb; and third, the mucous membrane lining this cavity must be absolutely healthy in order to develop the ovum after it has been impregnated. If, therefore, any of the three conditions above mentioned should be lacking in their vital and fundamental properties, conception cannot take place. If, for example, as frequently happens, the male germ (spermatozoön) be incapable of impregnating the female egg, or that fluid should fail to reach the womb on account of some defect or disease of the male sexual organ, conception is quite impossible. Indiscretions in early life on the part of the male are often the cause of the failure above mentioned, but in general cases the female is at fault, for the following reasons:

First, any cause that prevents the seminal fluid from entering the womb.

Second, any condition that prevents perfect eggs from forming in the ovaries.

Third, any condition that prevents the eggs from gaining entrance into the womb.

Fourth, any condition that prevents the impregnated egg from finding a lodgment in the womb and obtaining nutrition from the lining membrane of that organ.

The seminal fluid may be unable to enter into the cavity of the womb on account of displacement of that organ; or because of too small an opening into its cavity, or of fibroid tumor.

The perfect eggs may be prevented from forming on account of inflammation and tumors of the ovaries. The egg may also be prevented from lodging and developing normally by inflammation of one kind or another of the womb, or by profuse menstruation, or hemorrhage of the womb. The removal of any of these obstructions to conception is not difficult.

Treatment.—When caused by inflammatory diseases, the following douche is recommended:

℞ Acetate Acid one-half ounce
Glycerine one ounce
Water (hot as can be borne).....two quarts

CONSTIPATION

Definition.—Constipation is a most common and wide-spread ailment, to which both sexes are subject, although it is more common in women, and occurs at all stages of life. This complaint may be present continuously for a number of years, owing to the neglect and carelessness of the patient. It is a well known fact that many females have been afflicted with constipation from infancy to old age. It may occur in infants of both sexes through weakness of the intestines from birth, but it is most likely to result from improper food. Constipation is most frequent in persons from thirty to fifty years of age, and it is safe to say that out of every ten persons three are so afflicted.

Causes.—Sedentary occupations, lack of proper and adequate exercise by means of which the bowel and liver secretions are stimulated to proper activity, and the habitual neglect to meet the demands of nature promptly in this respect, are the chief causes of this troublesome ailment in women. Hereditary muscular weakness is another cause; also lack of secretion in the bowels; laceration of the perineum; faulty diet; and a general lack of precaution for the preservation of health.

Any derangement of the liver which may lead to a deficiency of bile may cause constipation, and this type of constipation generally occurs when something has interfered with the proper evacuation of the undigested remnants of food.

Women, although of sound physique and normal intellect, but all of whose functions, mental and bodily, are slowly performed, are specially liable to constipation; and women of an active temperament, if deprived of their usual exercise for a few days, or especially if they should engage in sedentary employment, at once begin to suffer from this malady in a very marked degree.

Drinking-water, very hard or very soft, is responsible in some cases for a constipated condition, owing to the astringent or binding effect produced by too great a proportion of lime salts or by lead dissolved from water-pipes. A change in the quality of drinking-water to which one has been accustomed is also liable to produce constipation, although sometimes it has a directly opposite effect. Some diseases of a constitutional nature,

of which diabetes is the chief, produce marked constipation. Chlorosis, or green sickness, is another condition which is associated with constipation in young girls, but fortunately in such cases it yields readily to treatment.

Local Causes.—The passage of food through the smaller intestine occupies about three or four hours, and it takes sixteen hours through the larger intestine, notwithstanding it is wider and shorter. In constipation, the delay in evacuation generally takes place in the larger intestine. The passage through the larger intestine may be obstructed by tumors in the vicinity of or inside the bowel; by the enlarged womb during pregnancy; by displacement of the various organs of the abdomen; by narrowing of the passage owing to the scars of previous wounds; or simply by a large mass of hardened excreta due to long-continued constipation. Apart from these rarer conditions, most cases are due either to the fact that the lower part of the bowel has lost its tone and is soft and weak, or to the fact that its movements are irregular, instead of being directed toward squeezing on the feces, slowly and methodically, to the outlet. This latter condition is found in those who, instead of making a habit of relieving the bowels daily at the same hour, neglect this important natural function and ignore the call of nature at all times except when it is absolutely necessary to obey.

In women suffering from a painful condition of the bowel itself, such as piles, or of neighboring organs such as the ovaries, womb, or bladder, constipation also occurs; and in women of more or less advanced age, constipation of a spasmodic sort is often a great annoyance, the excrement being passed in small, hard pieces, and not uncommonly covered with skin-like fragments of mucus produced by the chronic irritation which the retained feces set up in the mucous membrane lining the bowel. The condition of flaccidity or softness of the large intestine is the result of long-continued distention or stretching of the bowel by the accumulated fecal matter. In elderly women who have borne several children, and in neurasthenic women—that is to say, women who suffer from functional derangement of their nervous system and whose entire muscular system has become flaccid—constipation often occurs. It also occurs sometimes when too little food is eaten, or when the great bulk of the food consists of a substance such as milk, which, although a perfect

food from a nutritious standpoint, leaves no residue to stimulate the wall of the intestines to activity. A similar condition follows as a reaction after the copious evacuation of the bowels due to a drastic purgative and in persons who habitually use aperients.

Symptoms.—Among the most marked symptoms are loss of appetite, furred tongue, general weakness, mental depression, heaviness, nervousness, sluggishness of the liver, and tired feeling; and the stools are hard, dark, and passed with much difficulty and in small quantities. If the condition should be prolonged so that there is an undue collection of the feces, it is liable to result in perforated bowel, ulcerated colon, piles, and inflamed bowels, and the contents of the bowels are liable to become dry and hard, lodging in large, compact masses, so that removal cannot be effected without considerable difficulty.

In women who have been victims of habitual constipation, diarrhea, with nausea and vomiting, may also be regarded as a symptom of constipation. Sometimes the entire system is poisoned by absorbing a portion of the contents of the bowels, and this poisoning will invariably return at fixed periods until the constipation has been corrected. It is not to be denied, and it is quite unfortunate, that lack of adequate conveniences which would enable many women to respond promptly to nature's call, is one of the causes which encourage constipation.

Swelling of the abdomen often occurs from the retention of large masses of undigested food, colic is common, and there is special liability to the occurrence of such affections as peritonitis and appendicitis. Piles, which are a result of constipation, are often brought on by habitual inattention to the bowels. When the condition has become habitual, there is derangement of the entire digestive apparatus, bad breath, foul tongue, and impaired appetite. The other bodily functions also become impaired, so that headache, bloodlessness, tendency to apoplexy, debility, fatigue, and loss of memory are very common occurrences.

Treatment.—The first and primary aim in treating constipation should be to correct, as far as possible, any of the general causes above described which tend to induce the condition. If the case should not be the result of diabetes, chlorosis, impure drinking-water, tumor, or some other source of mechanical obstruction, the most essential matter is the regulation of the daily habits.

The person affected should not sleep for an unreasonable length of time and should take a certain amount of exercise each day, which must be determined by the physique of the individual. At all events, the habit of evacuation of the bowels at the same time every day should be cultivated; a definite hour should be fixed, preferably after a meal, the best time being after breakfast—and no matter whether there be a sensation that the bowels will move or not, the attempt should be made. Women who are at all robust have the vital functions quickened by a cold bath on rising, and everything that tends to tone up the system will have a beneficial effect in overcoming the constipation.

People of a robust type can also find a valuable remedy in the treatment afforded at mineral springs, such as Saratoga Springs or Hot Springs, Virginia, though this course is not suitable for feeble or bloodless women.

When the bowels are sluggish and when milder means have not accomplished the desired result, aperients and purgatives should be employed, but they should be used in such a manner as to constitute an article of diet. For example: a few drops of the liquid extract of cascara with a half-teaspoonful of glycerine in water, three times a day after meals; or an after-dinner pill of aloes may be taken. Liquid paraffine in doses of a dessert or tablespoonful is an excellent and safe remedy for prolonged use.

For constipation associated with piles or rheumatism in women advanced in age, one of the best remedies is the liquid paraffine. Women in whom constipation is associated with a fatty or congested liver may take an occasional dose of blue pill. Women of a generally flabby or neurasthenic type are often much benefited by massage of the abdomen, which consists of firm rubbing around this part in a circular motion so as to stimulate the gentle movements of the bowels—and also by various forms of electrical application. When the flabbiness affects the lower end of the bowel only, and it is felt that the excreta are ready to be passed, an injection of a few ounces of warm water may be used every morning, or when this is useless and the feces are very hard, a pint or more of warm soapy water, or half a pint of warm olive-oil may be used occasionally. These warm injections must not, however, become a regular habit or in the

end they will simply increase the flabbiness from which the constipation arises. Instead of the enema, a teaspoonful of glycerine may be injected with a small syringe, or a suppository of glycerine or a pellet of common soap as large as a hazel-nut may be introduced into the bowel after breakfast.

Other appropriate agents would be two teaspoonfuls of Epsom salts in the morning in warm water on an empty stomach; or two teaspoonfuls of castor-oil; or from fifteen to twenty grains of powdered rhubarb. The chief value of cascara sagrada, previously mentioned, consists in the fact that it insures future movements which become easy and quite regular; it may be taken in the form of fluidextract in doses of fifteen drops in a little water on retiring, or in tablet form, which is far more convenient to take.

The following are found to be beneficial:

℞ Fluidextract of Senna two ounces
Fluidextract of Cascara two ounces
Glycerine one ounce
Simple Elixir one ounce
Mix.
Dose: One teaspoonful in a little water, three times a day.

Or:

℞ Fluidextract of Calumba four drams
Peppermint-water three ounces
Mix.
Dose: One teaspoonful in a little water, every three or four hours.

Or:

℞ Compound Licorice Powder four ounces
Dose: One tablespoonful in half a glass of water, each night.

Diet.—The diet is also of vital importance. There is a mistake made when the food is too concentrated and not irritating enough, although the same trouble affects women who live on a coarse vegetable diet. As a rule, however, the diet should be changed to include oatmeal, brown bread, green vegetables, and fruit, especially prunes, which have a large indigestible residue, and a considerable amount of fluid should also be taken

into the system. The juice of an orange or lemon in the morning, or a glass of one of the milder aperient waters, such as Hunyadi, in strength of about a wineglassful to a tumblerful of plain cold or warm water, taken immediately on arising, will also prove very beneficial.

When a coarse diet has been tried without beneficial effect, especially in women who have been addicted to the use of drastic purgatives, a change to a diet of milk, white soups, and fish, in small quantity, avoiding meat, eggs, and all coarse vegetables, is more than likely to be highly valuable. Whichever diet is taken, soft fats such as cream, butter, and salad oil in large quantities are of considerable value; and mild laxatives such as a teaspoonful of lime juice in water, taken as a drink after each meal, are very useful in all stages of constipation.

THE MENOPAUSE—CHANGE OF LIFE

The menopause, or "change of life," is sometimes known as the climacteric—the second critical period of a woman's life. It is the change that all women dread, as at this time they become prone to many constitutional derangements, and its occurrence is always accompanied by manifestations which make her notice that she is a new woman, a changed woman, and that the period of decline and inactivity is at hand.

This condition applies exclusively to women, although changes similar to those noted in women can be noticed in men at the time when their physical standards have reached their end. This change usually takes place between the ages of forty and fifty. Its occurrence before the fortieth or after the fifty-second year is a sign that it is abnormal, not physiological, and this change needs attention.

The change of life varies between much wider ages than the onset of the periods, and in about half of the total number of women the periods cease between the ages of forty-five and fifty. A continuance of menstruation beyond the age of, say, forty-five, especially if the periods be very severe, usually means that there is some very definite cause, commonly a simple tumor of the womb, which should be attended to. Much more important, however, is a return of bleeding after the change of life has been properly established. This should always excite the gravest sus-

picion, and at the very first occurrence of any return of bleeding a doctor should be consulted, as it is so frequently due to the early stages of cancer. If taken early a great deal may be done, and the woman's life saved by operation; but too often, alas, no attention is paid to it, and months are allowed to elapse before a doctor is consulted, by which time the growth has made such progress that the case is utterly beyond all hope of cure. One cannot be too emphatic on the importance of this point. Of course the symptoms may arise from some minor cause, but the danger is far too great to admit of any delay. A woman who neglects such a symptom for months is virtually committing suicide, and choosing for herself a particularly slow and painful method of doing it.

At the change of life, which indicates the end of the child-bearing period, various alterations occur. They are all physically in the direction of atrophy. The breasts become smaller as regards gland tissue, though they may become more prominent owing to the tendency some women have to grow stouter at this period of life. The whole body may become markedly thinner or fatter. Internally the generative organs atrophy and become small. As there is a great readjustment going on in the system, the general symptoms are sometimes severe. Headaches and dizziness may be of frequent occurrence. A troublesome complaint is the frequency of severe flushings of the face and body which occur at this time. At the same time the nervous system is sometimes in a very unstable state, and some women are the subjects of nervous breakdowns which may last many months. The periods may stop suddenly and never return. More commonly there are irregularities, a month or two being missed, and then a period comes which may be normal in amount but is usually more severe. Occasionally there are very severe hemorrhages, which gradually get less till the "menopause," as doctors call the final ceasing of menstruation, is established.

Influences modifying its occurrence and duration are:

1. *Race.*—Different tribes possess a hereditary tendency to have the change at definite periods, and the change becomes less marked as the lower animals are approached. In humans of low-grade intellectual development there is no regularity during life of the menstrual periods, with the result that the change is not observable. As the higher grades of civilization are approached,

the menstrual periods and menopause become very prominent factors in life. It is not to be concluded that any pathological disturbance occurring at menopause has any bearing on intelligence; the above statement refers to races taken as a whole.

2. *Climate.*—The external climatic conditions have been found to vary the time and duration of menopause. In warm and temperate zones the change occurs early; the people reach puberty very early and their period of reproduction is shortened accordingly. In the Arctic regions the effects of the extreme cold have an opposite effect on menopause to the extreme heat. The people of the North are later in development and they are deficient in growth, with the result that the female has the menopause occurring very late in life.

3. *Altitude.*—The relation between this factor and menopause is due to a relative change in the air-pressure. It has been found that when women change from high altitudes to sea-level there is a great disturbance in the menstrual flow, with the result that the menstrual periods may be abolished or the interval is greatly increased between periods. If women stay at a high altitude all their lives there is no such disturbance, because their body has accommodated itself to the reduced pressure—and the disturbance spoken of above is brought on by an abrupt change.

4. *General Physical Condition.*—The general condition of a woman has a distinct relation to the onset of menopause. Those suffering from severe constitutional diseases, with poor resistance, will always have a pathological condition arise at menopause; in fact, the changes may be brought on early. Those suffering from tuberculosis, anemia, and Bright's disease are examples of the above class. If a disease is apt to kill a person within a few months, nature attempts to preserve life longer and this stops the waste of blood during menstruation.

The Phenomenon.—This is a permanent arrest of all the functions of the reproductive organs. It is just the reverse of the period of onset of the functions of reproduction or puberty. It is the end of the generative life of the woman.

It is the conception of many that this period of life of the woman must necessarily be attended with illness. Many healthy women pass through it with no or but trifling inconvenience. There is no need for anxiety, as it causes only an aggravation of the symptoms of ill health.

Any untoward symptoms causing great disturbance of mind or body should at once be brought to the notice of the physician for prompt attention. They should not occur in the healthy woman and their appearance should not be attributed to the change of life; their neglect may lead to an intolerable train of misery, making the remainder of her life a wreck and shortening it.

Signs.—The signs may be divided into two stages: first, the irregularity of the menstrual periods which precede the entire cessation of the monthly periods; and second, the disturbance brought about in the general make-up of the woman which follows this change.

In the healthy woman the irregularity of the periods brings about but slight symptoms, such as hot flushes occurring over the body, flushed face, and the emotional side of the woman may be much increased. Nervousness is increased and she is easily upset, and may suffer from sleeplessness, dizziness, fainting attacks, and headaches.

The symptoms are not alike in all women, for they vary in accordance with the different constitutions. The change takes place in some by the gradual lessening in the quantity of the discharge, while in other women there is a lengthening of the intervals between the menstrual periods—that is to say, instead of being only twenty-eight days apart, they are five, six, or even seven and eight weeks apart. This period is passed by some women with no more unpleasant symptoms than an occasional rush of blood to the head or a headache. In others there are frequently very severe symptoms, which should receive the most careful and prompt attention, lest by neglecting them in the belief that they are natural sensations in the "change of life" period, they become such a source of continual trouble as will bring an almost intolerable train of miseries, making the balance of a woman's life a veritable wreck, or even tend to shorten it.

The following symptoms, if carefully and accurately observed, will seldom fail to give a reliable clue to the actual conditions: Dizziness, headache, biliousness, sour stomach, indigestion, diarrhea, constipation, piles, itching of the external organs, cramps and colic in the bowels, swelling of the limbs and abdomen, palpitation of the heart, pallor, pains in the back and loins, and general weakness. The most frequent symptoms of disturb-

ance during this period are, however, mental, and a hysterical nervous state is so common as to excite little or no attention. The woman has a tendency to solitude, disturbed sleep, impaired appetite, and other kindred symptoms, and in some cases there is great agitation of the mind, and nervousness, bordering on insanity, and in such cases the means of relief should not be restraint, but soothing and quieting. The prevalence of these symptoms is largely due to the natural but groundless dread which women have of this period. Their mind is unnecessarily anxious about it, and this extreme anxiety gives rise, in a large number of cases, to the nervous symptoms.

The length of time from its inception until the final occurrence of the last period is variable. It may occur suddenly and the periods fail to appear. (This occurs in but a small percentage of women.) It may extend over a period of time of five years, the periods appearing with less and less regularity and with greater intervals of time until their final cessation.

The Changes in the Body that occur at the menopause are: the ovaries cease to functionate and shrivel up; the ovarian tubes become narrow, occluded, and shorter; the womb becomes hard and small and its cavity may be obliterated; the neck of the womb or that part of the womb which is in the vagina also becomes small and may even disappear; the vagina becomes narrow, short, and tough and hard to the touch, the opening contracting to a small size; the external organs become smaller; the hair becomes gray and the skin is dry; the breasts shrivel and their function ceases. The woman at this time is either very thin compared to her weight before its onset, or puts on a great deal of fat.

Abnormalities of Menopause.—The nervous system may be so deranged that the woman is very irritable; fear may become a symptom causing grave concern, and the woman may become hysterical or melancholic, or even show signs of insanity.

The periods, when they occur, may be profuse or continue over a long period of time. These hemorrhages need careful attention.

There is at this time an increased danger and a great susceptibility to growths of the womb, such as fibroids and cancer. This is true also of the breasts. In the stout woman there is an increased tendency to congestion and inflammation of the organs,

as in the lungs or brain, due to the shutting off of the periodic safety-valve, which leaves no outlet for the extra amount of blood.

Indigestion, constipation, or diarrhea may accompany the changes of the menopause; cramp-like pains in the abdomen, back, and loins need prompt attention. There may be itching of the external organs of generation, piles, and swelling of the limbs. In the nervous type of women, palpitation of the heart, dizziness, pallor, and general weakness occur.

Treatment.—All anxiety and causes for worry and apprehension should at once be removed from the environment of the woman. In the stout, corpulent, plethoric woman, all stimulants should be avoided; she should take moderate exercise, plenty of fresh air, and live on a reduced diet consisting chiefly of fish and vegetables, greens, salads, and fruits.

A woman habitually leading a clean, temperate life and in good health may be sure of but little disturbance, but one who has led an irregular, luxurious life or a life of faulty habits must be convinced that it is necessary to come around to the simple method of living, by regular systematic exercise and abstinence from immoderate and excessive indulgences.

All women should eat and drink moderately. The sleeping-room must be well ventilated, large, and airy. All stimulants should be abstained from, especially the alcoholic. Plenty of open-air exercise should be taken, such as riding and walking. All emotions and exposure to inclement weather and wet feet should be avoided.

For excessive bleeding during the course of the periods take the following:

℞ Fluidextract of Viburnum two ounces
Simple Elixir one ounce
Mix.
Dose: One teaspoonful in a wineglass of ice-water, three times a day until bleeding decreases.

Observance of the following precautions before the menses have ceased to flow is vital to health and should be strictly carried out:

Avoid anything that will cause a sudden cessation of the flow, as this may be dangerous; therefore do not get your feet wet

during that period and do not take cold baths at that time. A general bath at regular intervals in lukewarm water is beneficial. Keep the bowels open but do not use strong purgatives. Use the following laxative:

℞ Cream of Tartar one ounce
Phosphate of Soda.....two ounces
Compound Licorice Powder two ounces
Mix.
Dose: One teaspoonful in half a glass of cold water, night and morning.

The following tonic has been found useful:

℞ Iron and Quinine Citrate two teaspoonfuls
Simple Elixir three ounces
Mix.
Dose: One teaspoonful in a little water, after each meal.

For dyspepsia use:

℞ Tincture of Gentian Compound .. one tablespoonful
Essence of Pepsine three ounces
Mix.
Dose: One teaspoonful in a wineglass of water, after each meal.

Urine examinations ought to be made at regular intervals; and any derangement of the kidneys at this time requires special and prompt attention.

For headache in cases where anemia is present, as well as constipation, give the following:

℞ Pills of Aloes and Iron.
Dose: One pill three times a day, half an hour after meals.

For a condition of nervous unrest or hysteria during the menopause, the following will be found useful:

℞ Elixir of Valerate of Ammonium six ounces
Dose: One to two teaspoonfuls in water, once or twice a day.

To relieve the headache and drowsiness commonly felt by nervous women at the change of life, camphor, which will usually

give relief at once, is one of the best remedies. It is used as follows: Cologne water, saturated with camphor, rubbed into the scalp; and a lotion of equal parts of ammonia-water and spirits of camphor dabbed on the painful spots at the top of the head.

One of the most common and most distressing and annoying nervous disorders met with is due to the loss of function of the ovary and the resultant products of internal secretion, which is so essential in maintaining the necessary balance to the other organs of internal secretion; the normal function and integrity of which are so easily disturbed by the loss of the proper ovarian secretion, which with the associated disturbing nervous and mental symptoms, is almost entirely relieved by the use of remedies, carefully prepared from the healthy ovarian structures selected from suitable animals, and properly termed "Animal Extracts." Several of these products are now on the market and are available to those who need them, namely, "Lutein"—"ovarian extract" and "ovarian residue." Taken in 5-grain doses in tablet or capsule form three times daily for a period of from 6 to 14 months. Where the nervous symptoms are not relieved by the above form of treatment, it is highly probable that the functions of the other glands of internal secretion are being disturbed, and the addition of small doses of "Thyroid Substance," one-half to one grain doses three times daily, will be found to be effective.

As this is one of the most critical periods of a woman's life, it is absolutely necessary that great precautions be taken in the care of the general health so as to enable a woman to pass through it safely. The following rules, if strictly adhered to, will save a great deal of pain and worry:

Keep the body warm.
Do not overexert yourself.
Keep the feet dry and warm.
Abstain from all alcoholic liquors.
Eat nothing but plain, nutritious foods.
Spend a great deal of your time out of doors.
Keep the pores of the skin open by taking hot baths.
Keep regular hours; sleep at least eight hours a day.
Take frequent injections boric acid or bicarbonate of soda.
Keep the bowels regulated; have at least one movement a day.

DISEASES OF WOMEN

THERE is no class of persons whose system, owing to its peculiar structure, is more liable to derangement than a woman's. The construction of a woman is liable to peculiar, morbid conditions, and as a physician may not be easily accessible when one of these conditions gives rise to a very serious emergency, a treatment of diseases peculiar to women, with suggestions as to what may be done in such an emergency, will doubtless be of invaluable service.

DISEASES OF THE FEMALE GENERATIVE ORGANS

It is by the use of the speculum, an invention by Professor Récamier of Paris, that an intelligent and tolerably fair understanding of these affections has been gained, and also by the general use of the digital and ocular means of examining the female sexual organs. Myriads of women have passed years of misery and wretchedness, have languished and died for the want of aid which they could have had if a proper knowledge and understanding of these affections had been in the possession of the medical profession. The speculum and the stethoscope are two invaluable instruments which have been an inestimable boon to mankind.

Many women suffering from diseases of the sexual organs have endured intolerable sufferings because of their repugnance to the necessary examination, or to communicate voluntarily any information with regard to their symptoms. There is nothing that has a greater tendency to retard the knowledge, the prevention, and the cure of female diseases than false delicacy. When a woman has become affected with a genital complaint, she shrinks from informing a physician, with the result

that a simple ailment which could easily have been cured in its early stages, develops into a serious condition, and when finally availing herself of medical aid, instead of candidly informing the doctor of her symptoms as she would do in the matter of any other illness, she tells nothing spontaneously, but places the burden on him to draw out, piecemeal, the necessary information, and at times this misleads the physician into most serious and lamentable errors.

In a multitude of cases the disorder is not regarded as being of a serious nature and medical aid is not sought, so that the unfortunate woman continues to bear her ills in silence as long as they are endurable. This indiscreet and mistaken silence is the reason why leucorrhea, diseases of the womb and ovaries, and kindred affections are often endured for years, causing untold suffering and breaking down the health beyond recovery.

This false modesty, however, is not confined to the diseases of the sexual organs, for piles, constipation, diarrhea, and morbid conditions of the urinary organs are also very reluctantly revealed by the patient, and often neglected for years.

INFLAMMATION OF THE VULVA—VULVITIS

Causes.—Inflammation of the vulva is for the most part due to general debility of the system and to conditions in it which give rise to congestion of the pelvis, such as tumors or pregnancy. It may also result from excessive sexual intercourse, friction due to improper adjustment of a pessary, discharges of an irritating nature from the uterus, uncleanliness, masturbation, worms, germs, irritation from the urine in cases of diabetes, and as a complication in gonorrhea.

Symptoms.—The pronounced symptoms in connection with this disease are swelling, redness, heat, dryness and itching of the parts, leucorrhea, indicated by a creamy discharge, preceded by a thin, watery one. Other symptoms which manifest themselves are a burning sensation about the entrance to the vagina, want of appetite, backache, frequent desire to void urine, and at times nausea.

Treatment.—The method of treatment consists in perfect cleanliness and keeping the bowels open. The discharge should

be thoroughly washed off with a weak astringent solution such as the following:

Sulphite of Zinc one-half teaspoonful
Water one pint

Or:

Boric Acid one teaspoonful
Water one pint

Or:

Creolin one-half teaspoonful
Water one pint

Or:

Nitrate of Silver eight grains
Water one pint

The last solution is probably the best for the purpose.

Should there be superficial ulceration, the pimples may be touched with a solid stick of nitrate of silver. After washing the area affected by vulvitis, a sterilized piece of gauze which has been soaked in a mild astringent solution such as the above, should be used as a means of keeping the abraded mucous surfaces from coming in contact.

PURULENT VULVITIS

Definition.—This may be an extension of a gonorrhea from the vagina, or simply come from uncleanliness, friction, or injury.

Symptoms.—The area becomes red and dry. After a day, pus forms and flows freely. There is very severe pain and intense itching. The pus may spread up the urethra into the bladder, giving rise to a cystitis.

Treatment.—The important thing is to keep the parts clean; complete rest, and a light, nourishing diet. Saline purges should be given freely, such as Epsom salts or Rochelle salts. The following prescription should be applied to the affected area:

℞ Borax one tablespoonful
Bicarbonate of Soda one tablespoonful
Glycerine one ounce
Liquid Carbolic fifteen drops
Rose-water four ounces

Mix.

FOLLICULAR VULVITIS

Definition.—This consists of inflammation of the sweat-glands or mucous glands.

Symptoms.—There is a burning and itching of the vulva, with a great deal of inflammation, often accompanied with a very irritating discharge.

Treatment.—The inflamed parts should be treated with a caustic pencil. The following prescription should be applied, and the parts must be cleansed night and morning with hot water.

℞ Lead-water seven ounces
Tincture Aconite one ounce
Mix.
DIRECTIONS: Apply to painful area.

At night, before retiring, the parts should be covered with carbolic salve and kept covered with clean linen.

ABSCESS IN THE VULVA

Causes.—Inflammation of the vulva is often followed by abscess. It results from the clogging of the minute, hair-like canals which are the channel of communication between the small glands on each side of the mouth of the vagina and its surface. This communication is carried on by means of a watery fluid which the glands secrete. When the passage of the fluid through these glands is obstructed and the fluid therefore cannot get an outlet, the glands distend or expand and give rise to a doughy swelling not attended with pain. If this condition is allowed to remain, it will result in an abscess in and around the gland involved.

Symptoms.—One of the first means by which this affection is detected is pain caused by sexual intercourse or by a tumor discovered by chance, otherwise the affection is likely to exist undetected for a considerable length of time. The abscess has well marked features; it is soft, its size varying from that of a hazel-nut to that of a small egg, and the vulva is unduly hot and tender by the time pus has developed. The abscess in many cases opens by spontaneous action, thus giving the first indica-

tion of its presence by the discharge of matter; in other cases, the abscess dries up completely and disappears spontaneously; or it may decrease in tenderness and painfulness and continue for a very considerable time, causing much annoying discomfort to the patient.

Treatment.—In the treatment of this affection, should there be severe pain and undue tenderness, considerable relief will be afforded by the application of a flaxseed poultice or of cloths immersed in hot water and wrung out; and this is usually all that such a case requires. Sometimes, however, owing to the dimensions of the tumor which effectually obstructs the exercise of natural functions, the use of the surgeon's lancet is a necessity in order to empty the contents and to effect a permanent cure.

ACNE OF THE VULVA

Definition.—Acne is due to an enlargement of the sebaceous glands of the vulva. It is very itchy and sometimes painful, because pus forms after scratching.

Treatment.—The best method of treatment is by cleansing the area with green soap, night and morning; after drying the parts thoroughly, gently rub on some sulphur salve and keep the parts protected with clean linen.

ERYTHEMA OF THE VULVA

Definition.—Erythema is a simple affection of the skin, due generally to local irritation from discharges from the vagina, or friction of the opposed surfaces, especially in stout women and children.

Treatment.—Attention to cleanliness, keeping the parts dry with powder, or the application of some astringent lotion, will usually suffice to relieve the condition. The following lotion is a very good one:

℞ Glycerite of Tannin one ounce
Rose-water three ounces

Mix.

Directions: Apply to affected parts with clean linen.

ECZEMA OF THE VULVA

Definition.—This is first noticed by an itching and soreness of the vulva.

Symptoms.—It is usually red in color and spreads to the thighs and abdomen. It is often found in women who have leucorrhea, or those with dribbling of the urine. The skin becomes hardened and there is a loss of hair on the affected parts.

Treatment.—The treatment consists in stopping the discharge and keeping the parts clean. Clean linen should be kept over the parts, and if the skin does not dry, dust with powdered boric acid.

In many cases the rash begins to spread very rapidly and becomes very itchy. In these cases the following prescription should be applied night and morning:

℞ Calamine three teaspoonfuls
Zinc Oxide four teaspoonfuls
Glycerine one ounce
Liquid Carbolic fifteen drops
Lime-water seven ounces
Mix.

Directions: Apply to parts with clean linen.

HERPES OF THE VULVA

Definition.—Herpes consists of numerous little papules and small blisters, and occasionally is found on the thigh.

Symptoms.—It is accompanied by painful bowel movements and weakness in the legs. These pimples and blisters break, leaving a raw surface, and a crust forms on top. Usually the disease does not last long, but relapses are common.

Treatment.—Locally, the application of a dusting powder, as stearate of zinc, together with constitutional tonics, often gives quick relief. The following is recommended as a tonic:

℞ Fowler's Solution two teaspoonfuls
Cod-liver Oil Emulsion six ounces
Mix.

Dose: One tablespoonful three times a day; for a child the dose is one teaspoonful.

PRURIGO OF THE VULVA

Definition.—This is a chronic papular disease of the skin, accompanied by intense irritation.

Symptoms.—It is so very itchy that it affects the entire constitution with marked weakness.

Treatment.—The application of carbolic salve to the skin where the itching is present often affords relief. The surrounding area should be well covered with talcum powder.

As a tonic, Blaud's pills are to be taken, as follows:

℞ Blaud's Pills, freshly made.....five grains
Dose: One pill three times a day, after meals.

SYPHILIDES OF THE VULVA

Definition.—This is found as small brown pimples, and when they dry they leave a brown or copper-colored stain. If they ulcerate there is great difficulty in healing.

Treatment.—The parts are to be dusted with powdered calomel, night and morning, and the following mixture is to be taken internally:

℞ Bichloride of Mercury one grain
Iodide of Potash three teaspoonfuls
Syrup Sarsaparilla four ounces
Mix.
Dose: One teaspoonful in a wineglass of water, three times a day.

WARTS OF THE VULVA

Definition.—These may follow the continuous irritation of the parts with unhealthy discharges. It does not necessarily imply a syphilitic involvement.

Symptoms.—If they are on the inside, they are usually soft, because they are kept moist. Sometimes, where treatment is not instituted, they grow to a very large size. They are not painful, but by acting as a foreign body they usually cause an increased discharge.

Treatment.—Small warts should be burned off with a caustic pencil, but one should not attempt this without help. If the base is loose, cut it off with clean scissors and apply the caustic pencil. Dusting them over and keeping the surface dry with powdered stearate of zinc will often check their growth. The surrounding skin should be cleansed with hot water, night and morning.

LUPUS OF THE VULVA

Definition.—This is a chronic affection often confused with syphilis and cancer.

Symptoms.—It occurs in women who are in poor health and do not keep themselves clean. It first appears only on the surface of the skin, and then it eats its way in deep. The surrounding skin becomes hard and knotty. It is not painful, but it is a long-standing disease. The skin at first becomes blue and then scales form on top; if these are removed, the ulcer becomes visible.

Treatment.—Relief is all that can be offered; complete recovery is rare. The ulcer is to be touched all over with a caustic pencil, and the giving of mercury is often valuable, in form of the following:

℞ Yellow Iodide of Mercury Tablets No. 48
Dose: One tablet three times a day, half an hour after meals.

CANCER OF THE VULVA

Definition.—A malignant tumor which usually spreads from the uterus to the vagina. Often the starting-point is on the clitoris.

Symptoms.—It begins as a small wart, without pain or itching. Gradually the glands on the thigh enlarge and give the first sign of disease. There are many varieties of cancer found in this region.

Treatment.—This should be started early, before the mass gets too large. It consists in removing the entire tumor by surgical means.

EDEMA OF THE VULVA

Definition.—This is a uniform enlargement occurring as a complication to diseases of the heart and kidneys.

Symptoms.—At first there is no pain, but as the part becomes large it becomes difficult to urinate. The part is enlarged and shiny, sometimes showing scales.

Treatment.—The treatment is entirely general, and with this a thorough urine examination should be made. The following prescription will afford relief:

℞ Compound Jalap Powder one teaspoonful
Divide into twelve capsules.
Dose: One capsule night and morning.

Diet.—The diet is important in this treatment, and it should be light, consisting mostly of liquids.

ENLARGED GLANDS OF THE VULVA

Definition.—This is an inflammation of the glands which are just outside the hymen.

Symptoms.—The duct of the gland becomes closed, causing enlargement of the gland. This greatly interferes with walking. An operation is necessary.

GANGRENE OF THE VULVA

Definition.—This consists of ulceration and death of the vulva.

Symptoms.—It comes in children who are very weak and anemic. There is bleeding and discoloration of the parts.

Treatment.—The patient's general health should be given immediate attention. To improve the appetite, give the following prescription:

℞ Compound Tincture of Gentian three ounces
Dose: One teaspoonful in a wineglass of water, three times a day, half an hour before meals.

Locally, the parts should be treated with a caustic pencil, and if the general health does not improve, give the following tonic:

Elixir Iron, Quinine, and Strychnine four ounces
Dose: One teaspoonful in half a glass of water, three times a day, after meals.

PHLEGMONOUS INFLAMMATION OF THE LABIA MAJORA

Definition.—This may come from injury or from exposure to cold. The parts become itchy and then the area becomes infected from scratching. Pus forms, and it has a very offensive odor.

Symptoms.—There is a throbbing pain present, and this is increased on walking. The parts are all very sensitive and gradually begin to swell.

Treatment.—First give rest, and apply lotions to the parts. The following lotion has often proved valuable:

℞ Burow's Solution six ounces
Directions: Dilute with equal parts of hot water and apply to parts.

The abscess should be incised and thoroughly drained. The surrounding parts should be cleansed each day with hot water and green soap. After the wound has healed, apply talcum powder to the parts each day after cleansing.

BOILS OF THE VULVA

Definition.—They are the same as boils on other parts of the body.

Symptoms.—There is much irritation and distress, and they keep forming one after another. They are painful when walking and often cause temperature.

Treatment.—The boils should be incised and a bichloride-of-mercury wash applied, or else paint them with tincture of iodine. General tonics should be given, as the following:

℞ Compound Tincture of Gentian two ounces
Simple Elixir two ounces
Dose: One teaspoonful in a wineglass of water, three times a day, before meals.

VARICOSE VEINS OF THE VULVA

Definition.—This is generally the result of pregnancy, and may occur after the birth of the child. Occasionally it is found in women who have never had children.

Symptoms.—The veins enlarge and appear as blue bands about the vagina; occasionally they rupture and give severe bleeding. When too large, they give pain.

Treatment.—The abdomen should be supported by a belt or corset, and if possible there should be rest in bed for about a week. If bleeding occurs, apply a silver-nitrate pencil to the part and apply a binder between the legs.

FISSURE OF THE VULVA

Definition.—Fissure of the vaginal orifice not infrequently occurs in newly married women. It may be just a separation of the mucous membrane, or else several mild ones may be present. Often it follows childbirth.

Symptoms.—The symptoms are very distressing and the seat of the trouble is hard to find. Intercourse is very painful and usually impossible. The surrounding parts become chafed from walking.

Treatment.—The parts should be covered with zinc salve and cleansed thoroughly with hot water. In some cases the parts must be sewed up by a surgeon. The patient should have rest and a light diet.

MALIGNANT TUMOR OF THE VAGINA

Definition.—Growths may develop in the vagina as well as in the womb, cancer being of frequent occurrence. Its origin may be in the vagina, or it may extend from the bladder, the womb, or the rectum to the vagina.

Symptoms.—This affection usually makes its appearance between the ages of thirty-five and fifty. The most pronounced symptom is a very offensive discharge, either thin and watery or thick; and hemorrhage frequently occurs after sexual intercourse

and upon straining in an effort to evacuate the bowels. The advanced development of the affection is usually marked by considerable pain.

Treatment.—The only way in which any material benefit can be obtained in this condition is through treatment by a competent surgeon and by having the diseased tissues removed before the cancer has advanced in development, for when the disease has reached an advanced stage, an operation is unadvisable, as has been proved by past experience. Should it be too late to attempt to perform an operation, the patient must be made as comfortable as possible, her strength maintained, and the pain alleviated. The following is considered a beneficial tonic:

℞ Beef, Iron, and Wine eight ounces
Dose: One teaspoonful in a little water, every three hours.

Or:

℞ Blaud's Iron Pills, freshly made.....five grains
Dose: One pill three times a day, half an hour after meals.

Moderate exercise in the open air has been found to be very beneficial.

A solution composed of four grains of permanganate of potash to two quarts of water as a vaginal injection, given two or three times daily, will be found effective in removing the foul odor. The patient should also protect herself by a napkin, being careful to have the same burned after removal.

As a precautionary measure, it is important that those in attendance upon the patient use particular care in keeping the hands thoroughly cleansed with plenty of soap and warm water to which a few drops of carbolic acid have been added, with a view to avoiding the possibility of infection.

OOZING TUMOR OF THE VAGINA

Definition.—This is a tumor which ulcerates, and is usually found in stout women who have given birth to children.

Symptoms.—Generally, it is only found on one side; the side of the vagina is enlarged and smooth. There is an increased secretion with a very bad odor, and this starts intense itching.

Treatment.—Locally, an astringent lotion is necessary, and the parts must be cleansed at least twice a day. The following lotion has proved beneficial:

℞ Calamine one tablespoonful
Resorcine one teaspoonful
Alcohol one tablespoonful
Rose-water four ounces
Mix.
Directions: Apply to affected parts about twice a day.

The following tonic is to be taken:
℞ Compound Tincture Gentian two ounces
Simple Elixir two ounces
Mix.
Dose: One teaspoonful in a wineglass of water, three times a day, before meals.

HYPERTROPHY OF THE VAGINA

Definition.—This is a smooth and uniform enlargement, and often follows childbirth.

Symptoms.—It is found mostly in women who have a poor circulation and varicose veins.

Treatment.—There is no immediate danger, but if the growth interferes with walking, an operation must be performed and a piece taken out.

CANCER OF THE WOMB

Definition.—A cancer is a malignant epithelial tumor composed of a connective-tissue stroma surrounding groups of epithelial cells.

Of all the diseases to which women are liable, this is the most terrible, and the dread which women entertain of it is well grounded, both as regards the frequency with which it occurs and its defiance of curative measures. It occurs, in the majority of cases, in those who are approaching middle life, and is more or less likely to appear when there is a predisposition to it by reason of the family antecedence; also when there has been a

severe laceration of the cervix or neck of the uterus, as a result of miscarriage or labor.

Causes.—Cancer of the uterus, although met with in single and sterile women, is far more frequent in those who have borne many children. Functional activity of the organ may thus be regarded as an important element in the production of cancer. Injuries inflicted on the cervix during parturition, inflammatory conditions resulting from these, granular degeneration of the cervical mucous membrane, and irritation from mechanical causes, will also explain the tendency to malignant degeneration, more especially if there be any hereditary predisposition to the malady.

Symptoms.—Hemorrhage, especially on sexual intercourse, is often the first symptom directing the patient's attention to the fact that anything is amiss, and even then it may be found that the disease has made considerable progress. In cases where the menopause has not yet arrived, the menstrual flow is often profuse, or the hemorrhage may recur at irregular intervals without any apparent cause, or upon any extra exertion or fatigue. Where the period of change of life has been reached and uterine hemorrhage recurs after a long interval, the possibility of cancer being present should always be suspected and a local investigation made. Hemorrhage, as a rule, occurs earlier in those cases where the disease assumes the vegetating form.

Pain, so long as the disease is limited to the cervix, is seldom complained of, and is by no means so frequent or severe as generally supposed until the disease has advanced to the later stage and the adjacent tissues have become infiltrated. The pain is usually spoken of as shooting, stabbing, or lancinating in character, radiating from the center of the pelvis to the lower portion of the back and groin, extending down the inner side of the thighs and not infrequently to the loins. It recurs at intervals, being very severe and persistent one day, and for several succeeding days so slight as to be hardly noticeable. It is generally worse at night, preventing sleep, thus differing materially from the pain attending chronic inflammation of the uterus, which is usually aggravated by standing or walking and is relieved when the patient assumes the recumbent position. In the later stages of the disease the pain is often agonizing and persistent, effectually precluding sleep and rendering the pa-

tient's existence most deplorable. The pain is often aggravated on locomotion or on sitting down.

Vaginal discharge, at first of a watery character and free from any well marked offensive odor, generally alternates with menorrhagia. As the disease progresses and the ulcerative stage is reached, this watery discharge is often tinged with blood and acquires a most penetrating and offensive odor, which clings persistently to the patient's linen. It soon assumes an ichorous character, excoriating the vulva and surrounding parts, producing most troublesome erythema and irritation. Later on, when disintegration of the cancerous mass commences, the discharge becomes mixed with blood and putrilage (gangrenous matter) and not infrequently with urine from extension of the ulceration to the bladder. Shreds of gangrenous tissue, decomposing blood-clots, and occasionally portions of the diseased mass are not infrequently expelled.

Treatment.—The only satisfactory treatment which can be recommended to afford any hope of recovery is the complete removal of the diseased tissue, as well as the removal of the healthy flesh immediately surrounding it. If, however, the disease should be detected in the early stage and before the cells of the cancer have reached the external part of the uterus, it can be treated with appreciable success for a number of years. Should there be undue hemorrhage as the period of menstrual decline, or "change of life," approaches, it is strongly advisable to have the operation performed at once.

X-ray treatment can only be carried out with difficulty, owing to the inaccessibility of the cancerous womb; furthermore, the benefit derived from the X-ray is still in a purely experimental stage.

In the employment of measures for the removal of the growth, its location and the extent of the area affected must be the chief guide. The removal of the tumor while the disease is still in its early stage does not necessarily involve any danger to the life of the patient, and it is always advisable to perform an operation then, as the saving or prolonging of many a life on this account is a matter of record.

Constitutional Treatment.—It will frequently be noticed that patients afflicted with cancer are in good general health at the beginning, well nourished and even robust, showing that the dis-

ease does not arise from want of tone or defect of nutrition. Under these circumstances it is seldom advisable to suggest the patient's taking plenty of nourishment and stimulants to "keep her up," as the disease is probably thereby increased and its growth accelerated. The better plan is to take a light, unstimulating diet, such as milk and farinaceous foods, and to avoid alcohol, unless for special reasons.

Physiological rest is absolutely essential; fatal attacks of hemorrhage have before now resulted from a neglect of this precaution; in any case, the disease would be rendered more active, and if pregnancy should happen to occur, the risk would be very great at the time of parturition.

It is by no means requisite to enjoin complete rest, provided the pain and hemorrhage are not increased by moderate exercise, whether walking or driving. The mere fact of keeping the patient constantly indoors has a prejudicial effect on the general health and is apt to depress the mind very greatly. As to the effect of drugs, no remedy has yet been found that has borne the test of prolonged experience as exercising any specific influence on the progress or cure of cancer.

Iron, in combination with salines, often proves of service in improving the health. Quinine in some cases does good, and cod-liver oil is useful in improving the nutrition of the body.

℞ Syrup of Iron Iodide two teaspoonfuls
Emulsion Cod-liver Oil eight ounces
Mix.
Dose: One tablespoonful half an hour after each meal, with a swallow of water.

The second object to be attained by treatment is to secure and maintain a strict hygienic condition, thorough cleanliness to avoid all odor, and to control and repress hemorrhage. Copious injections of warm water should be used, and the following douche will also be found beneficial:

℞ Powdered Boric Acid two ounces
Carbolic Acid fifteen drops
Mix.
Directions: One teaspoonful in two quarts of warm water, and use as a douche.

Or:

℞ Bichloride of Mercury seven-grain tablets
Hot water two quarts

DIRECTIONS: One tablet in two quarts of hot water three times a day as a douche.

Or:

℞ Sulphate of Zinc two ounces

DIRECTIONS: One teaspoonful in two quarts of warm water, and use as a douche.

In case thorough cleanliness is not secured by the injections alone, let the patient take a warm hip-bath night and morning; and if the hemorrhage should continue in spite of this means, considerable benefit may be derived from the introduction of the tampon, or packing with absorbent cotton saturated with vinegar or a solution of alum. The only value in medicines in such a case is to preserve and possibly increase the strength of the patient, also to give tone to the digestion, and to this end a tonic such as the following should be given:

℞ Dilute Muriatic Acid one tablespoonful
Essence of Pepsine three ounces

Mix.

DOSE: One teaspoonful in half a glass of water, after each meal.

Diet.—The patient's diet, while plain and nourishing, must not be stimulating or irritating, and it should contain plenty of milk.

POLYPUS, OR TUMOR OF THE WOMB

Definition.—A tumor of the womb is one that either projects into the cavity of that organ or hangs into the vagina. Polypi are a class of tumors that grow from membranes, and polypi of the womb are growths from the mucous membrane that lines the cavity of the womb.

Causes.—Their appearance is the result of protracted inflammation of the womb, as well as disturbances of menstruation.

Symptoms.—The symptoms which mark the early stages of this disease bear a close resemblance to the symptoms of other disorders of the uterus, such as pains in the back and loins, and

disorders of the menstrual flow, which are generally marked by increased profusion and pain. Leucorrhea invariably appears; there is an abundance of clots in the menstrual flow; but as these symptoms may be manifest in other morbid conditions, they cannot by themselves be regarded as conclusive evidence of the presence of a polypus. The discovery of this evidence is only possible by an examination of the vagina.

Although the life of the patient is not endangered by a polypus growth in the uterus, still the health suffers deterioration by its existence and there is serious interference with the functions of the sexual organs. A strange feature of a case of polypus growth in the womb is that Nature at times effects a cure of her own, causing the tumor to drop off and make its exit by way of the vagina. Such cases are, however, exceptional, as in the majority of cases there is a lingering and obstinate persistence of the symptoms above mentioned, which become aggravated, increasing in severity and not infrequently causing life to become unbearable to the patient.

Treatment.—It is advisable to proceed to treat this disease first by palliative rather than curative measures, until the symptoms have developed such severity as to make the patient very uncomfortable, since the more drastic or curative means are not free from peril to the patient. In order to palliate the symptoms, since the uterus is usually displaced by the tumor, it must first be restored to its normal position and kept in place by means of a pessary. Constipation should be avoided and the bladder emptied regularly. Tincture of ergot in doses of ten drops, three times a day, during the intervals between the menstrual periods, is beneficial. The patient must be confined to bed during the menstrual flow, and at the expiration of two or three days a plug of cotton saturated with a solution of alum, as a means of checking the flow, should be introduced into the vagina. If the flow should continue to increase at each successive menstrual period, so that a serious condition will arise from loss of blood, then the curative measures must be employed, and this consists in removing the polypus. As a general rule, this operation is attended with slight difficulty and little danger, but these features depend upon the location of the tumor. There have been some cases in which the operation has been followed by somewhat grave results, but these are rare and exceptional.

CHRONIC ENLARGEMENT OF THE WOMB

Definition.—This chronic condition of the womb is an affection to which the child-bearing woman is more or less liable, as it is the result of the womb's not resuming its natural size after delivery. The womb usually decreases in size with great rapidity during the two months following childbirth, but this process, which is known as the involution of the womb, may encounter some hindrance or interruption, such as too early exertion by rising and leaving the bed too soon after delivery.

Causes.—The chief and leading cause that gives rise to this condition is too early rising after delivery. Everything up to and including delivery may take place in the most natural and uneventful manner, but the lack of ordinary and self-evident discretion is liable to lead to a chronic enlargement of the uterus.

It is absolutely necessary to impress upon lying-in women the important and serious fact that this process of involution of the womb, above mentioned, should be allowed to proceed without the slightest interruption during the first two months following delivery, in order that the uterus may be afforded full and unobstructed opportunity to return to its normal size. By leaving the bed too soon after confinement, the mother incurs the grave risk of sustaining serious injury, as her health is likely to be impaired to a considerable extent by this too early exertion.

Miscarriage or abortion is another cause, and is indeed a fruitful source of this affection, it being impossible for the womb to undergo the process of involution or a return to its original proportions in a regular and uniform manner if the normal course of gestation should encounter any interference or interruption. The breasts, moreover, are usually inactive after miscarriage, and as the return of the womb to its natural position is facilitated and hastened by unobstructed milk secretions, it is evident that the serious and effectual interruption which abortion causes to the secretion of milk necessarily retards the process of involution; furthermore, it is the usual practice of women who abort to leave the bed and resume their ordinary duties sooner after abortion than they would have if delivery had taken place at the end

of the full term of pregnancy, and this undue early rising and exertion tend likewise to prevent the womb from recovering its natural position.

Chronic enlargement of the womb may also exist in a female who has never been pregnant, the dimensions of the organ being increased by protracted inflammation; by displacements; by the development of tumors; also by inflammation in some of the tissues in the vicinity of the womb; by excessive sexual intercourse, particularly near the menstrual flow; and by abdominal tumors entirely unconnected with the uterus.

Symptoms.—The symptoms are for the most part similar to those manifested by chronic inflammation of the uterus, namely, pain in the head, chiefly at the top; fatigue; pain in the back and loins; debility; pain during sexual intercourse; leucorrhea; and derangements of menstruation.

This complaint may also be manifested by symptoms common to pregnancy, such as enlargement of the abdomen and breasts and derangement of the stomach, which may excite the belief that it is the result of conception, which erroneous diagnosis is of frequent occurrence, especially among young women recently married, and even the physician will often experience considerable difficulty in determining definitely, during the first two months of connection with the case, just what the real condition is.

It has been very generally established that the means of distinguishing with approximate accuracy between chronic enlargement of the womb and enlargement due to pregnancy is furnished by the state of the menstrual function, as there is the usual suppression of the flow when conception has occurred, whereas in the case of inflammation or enlargement, menstruation, while it may be irregular, increased, or lessened, is very seldom actually suppressed.

The bladder and the rectum are often involved in complication with chronic enlargement of the womb, and the symptoms caused by the complication are likely to cause considerable difficulty in the detection of the original affection; as, for example, cases are frequently encountered in which the symptoms most marked are painful and frequent evacuations from the bowels or the bladder, and even leucorrhea, and it is not unusual to find dyspepsia, hysteria, and ovarian affections existing as complica-

tions which have arisen in connection with a chronic enlargement of the womb.

Treatment.—Unless the actual cause of the complaint can be accurately detected, no treatment can reasonably be expected to be successful as a palliative measure of temporary relief. The causes from which this affection is liable to result being so various, it is evident that the means to be resorted to for affording relief must be correspondingly different.

In many cases the condition of the general health of the woman exerts a marked influence upon the uterus, therefore improvement in the condition of the womb necessarily depends upon improvement in the health. The most effectual measure generally is a change in locality, as, for instance, a short stay at the seashore or mountains. The origin of the trouble may, as has often occurred, be in the womb, therefore the other phases of the case are only offshoots or conditions growing out of this primary or original complaint existing in the womb.

Laceration of the cervix or neck of the womb during delivery is often the cause of the whole trouble, and the entire train of symptoms can be eliminated by means of an operation which will cause the laceration to heal. It is therefore very essential to consult a physician in every case in which the existence of an affection of the womb is suspected on account of a combination of various symptoms, inasmuch as the physician will be able to determine whether the primary and original trouble has its seat in the womb, or whether the affection of the womb is a result rather than a cause of the constitutional malady.

Tincture of ergot in small doses of ten drops, three times a day, will be found highly beneficial. The dose should not be increased, because the contraction of the womb which is caused by the ergot is likely to be attended with severe pain in the womb and its surroundings, after the administration of the first few doses. The condition of the womb is responsible for what degree of pain is produced.

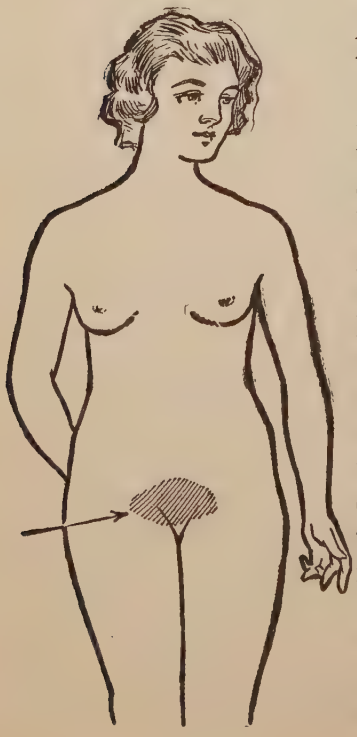
A hip-bath taken regularly twice a day is considered the most effective means, even superior to the vaginal injection, which may also be employed. A very beneficial injection consists of two or three teaspoonfuls of salt to a pint of warm water or very thin starch water, used twice daily, to be given while the patient is in a horizontal position. Another beneficial measure is to take

a plug of absorbent cotton saturated with boroglyceride and insert into the vagina at night, pushing it with considerable firmness against the neck of the uterus. Before inserting the plug of cotton, a string should be tied around it, leaving the end hanging out of the vagina in order that it can be readily removed in the morning.

SUBINVOLUTION OF THE WOMB

Definition.—The uterus is enlarged, congested, and displaced. This usually follows childbirth, and is due to the fact that the uterus remains large and does not contract after the child is born. At first the uterus is soft and flabby; later on it becomes hard. This is commonly termed a metritis, meaning an inflammation of the muscle layer of the womb.

Causes.—It usually occurs in persons with a feeble constitution and with poor absorptive powers. If the cervix or neck of the womb is torn in the passage of the child, this condition may follow. If a woman has a hard labor and gets out of bed too soon, she is liable to have this complication.



Symptoms.—The chief symptom is a feeling of weight and discomfort; there is a dragging pain in the pelvis over the area indicated by the shaded lines in the accompanying figure. As granular degeneration of the cervix complicates subinvolution, we have a leucorrhea and bleeding with the least exertion; irritability of the bladder is common. Together with these local signs, the patient has disorders of the stomach and loss of appetite. Occasionally, if the enlargement is posterior, there is great pain when moving the bowels.

Treatment.—Since this condition arises from childbirth, the doctor should try to prevent it when the child is being born. Do not let the woman

become weak from long labor. Clots which form after childbirth should be removed and the vagina syringed each day with tepid water. Movements in bed should be allowed after labor so that the uterus will have a little stimulation. The baby should be breast fed, because the mere fact of lactation often causes the uterus to contract. Fresh air and sunlight are important to improve the general health of the patient.

Abortions are even a more frequent cause of subinvolution than parturition. The cause which produced the abortion should be inquired into and obviated. The patient should have strict rest for a week. A little ergot may be given to aid the return of the uterus to normal.

General Treatment.—Everything conducive to improvement of the general health, removal of any uterine disorder, and attention to the ordinary requirements of the system are very necessary.

The diet should be simple and nutritious; stimulants taken in strict moderation. Warm baths are excellent and the bowels are to be kept open. Any tonic with iron as the basis will be found valuable, such as the following:

℞ Elixir Iron, Quinine, and Strychnine...four ounces
Dose: One teaspoonful in half a glass of water, three times a day.

Rest for several hours each day should be continued for about two weeks. Sexual connection should not be attempted. The physician should be consulted as to the cause and the internal treatment left to him.

GONORRHEA—URETHRITIS

Definition.—This disease is of the same nature in the male as it is in the female, the virulent and non-virulent types, but the different form of the sexual organs causes some important difference in their progress and treatment. Gonorrhea in the female is characterized by swelling of the lips of the vulva, redness and inflammation of the mucous surfaces, and a copious discharge of pus.

Causes.—The causes which give rise to this annoying and disagreeable affection are intercourse with a male who is affected with gonorrhea, or contact, by some means, with pus which has escaped from a male, the latter being quite possible and very likely, especially on the seat of a toilet.

Symptoms.—Attention is rarely called to acute gonorrhea in the female until the disease has reached a chronic state and has involved the womb and the uterine tubes, on account of the symptoms being generally so mild; however, when acute urethritis is discovered, it is necessary that the treatment be conducted on the same principles, both local and general, as when the disease occurs in the male urethra. The entrance to the vagina may be considerably swollen and exceedingly tender. The urethra, or channel of communication between the neck of the bladder and the exterior, is also frequently inflamed, and there is a scalding or burning sensation in voiding urine, which is more severe in the male than in the female. The mucous membrane lining the uterus and uterine tubes also becomes inflamed. Should the disease not be checked early, it will extend to the entire internal surface of the vagina and neck of the womb.

The wall of the vagina is either simply red and swollen or covered with isolated patches of redness, vesicles, pimples, or superficial ulcers, which are the products of inflammation.

After the disease has continued for some time, the mouth of the womb is always more or less affected; it is swollen and red and usually covered with small ulcers or granulations—that is to say, small elevations on the surface that is healing. The pain in the lower portion of the abdomen will become severe, and the fever will be heightened if the affection should spread to the Fallopian tubes and the ovaries, and should abscess develop, the pain and fever will increase in intensity. All the symptoms of acute inflammation of the womb will be manifested, should the disease spread to that organ, and in this event it will be absolutely necessary for the patient to remain in bed. Should the affection extend to the urethra and bladder, all the symptoms that accompany an attack of cystitis (inflammation of the bladder) will be present.

Treatment.—During the acute stage, when the disease is of short duration, local treatment is not advisable, but later on injections of antiseptic solutions may be used.

The following are recommended to be injected into the bladder by means of a hard rubber syringe having a long tip:

℞ Ten-per-cent. Solution of Argyrol.... eight ounces
DIRECTIONS: Inject two ounces into the bladder twice a day.

Or:

℞ Two-per-cent. Solution of Protargol.. eight ounces
DIRECTIONS: Inject two ounces into the bladder twice a day.

Or:

℞ One-half-per-cent. Solution of Silver Nitrate twelve ounces
DIRECTIONS: Inject three ounces into the bladder twice a day.

If the above injections do not stop the discharge, a stronger antiseptic will have to be used. For this complication a two-per-cent. solution of silver nitrate may be tried.

The vagina becomes inflamed from the persistent discharge of pus; this can be avoided or checked by washing out the vagina twice a day with a salt-water douche. Place four tablespoonfuls of table-salt in two quarts of warm water and use with a fountain syringe. When using the vaginal douche, the woman should lie in bed and raise her hips by placing a pillow under her body. After the injection, a small roll of absorbent cotton should be placed between the lips to keep the parts dry.

It is advisable that the woman take a hot sitz bath once or twice a day. This draws more blood to the parts and hastens the cure. During the acute stage these baths will afford great relief. If the lips of the vagina should become inflamed, some astringent powder should be dusted on the parts; for this purpose oxide of zinc is recommended.

The woman should take the best care of her health as soon as the disease is discovered, and she should have at least eight hours' sleep a day, in order to preserve her strength. No alcoholic liquors should be taken, and the patient should drink at least three quarts of water a day.

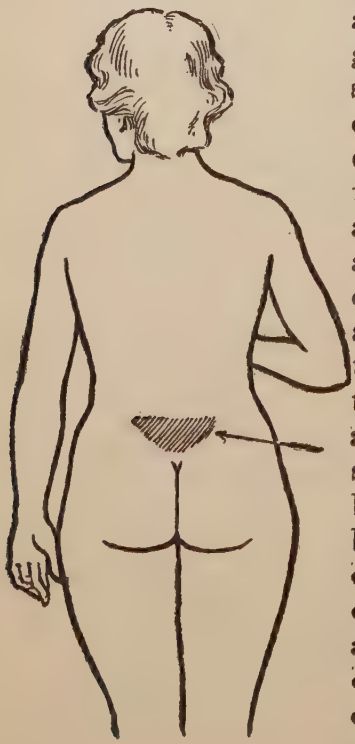
Diet.—The diet is important in this condition; it should consist of nourishing soups and broths, and very little meat should be eaten. Milk with cream should form a large part of the diet.

INFLAMMATION OF THE LINING MEMBRANE OF THE WOMB—ENDOMETRITIS

Definition.—This unfortunate condition very often follows delivery and exposure to cold during menstruation. There is first a clear, glairy discharge from the vagina, which later becomes yellow or bloody, accompanied by severe pains in the small of the back.

Causes.—Taking cold while menstruating; inflammation of the ovaries; the introduction of unclean instruments into the womb to cause abortion; severe, painful menstruation; chronic constipation; and very often gonorrhea.

Symptoms.—The symptoms of this disease are very marked, and special attention should be given to them before entering upon any treatment. There is usually a sense of weight and a sort of dragging pain in the small of the back (as shown by the shaded area in the accompanying figure), which frequently extends to the front and down the thighs; leucorrhea, painful menses, and bleeding from the womb are usually present. The vagina is the seat of a burning and itching feeling; there are frequent evacuations, due to irritation of the bladder and rectum. At the end of three or four days there is a discharge from the vagina, which is sometimes white, yellow, or bloody, but generally clear and glairy at the beginning. About the time that this discharge has appeared there is generally pain in the lower part of the abdomen, attended by a "bearing-down" effort similar to that experienced during labor. Prompt measures must be taken to arrest the progress of this dangerous disease, for if it be neglected and allowed to proceed unchecked and uncontrolled, there is great risk of its



seriously affecting the patient's health by involving other sexual organs in dangerous complications.

Treatment.—Employ injections of hot water in giving a vaginal douche every three or four hours daily, using about two quarts of hot water for each douche, and applying hot moist flannels to the vulva and groins during the intervals of the injection. These treatments should be applied after the patient is placed in bed and kept quiet. The patient should also take a hot hip-bath for about twenty minutes, two or three times a day.

If the menstrual flow is irregular, the following prescription, which has proved valuable, may be used:

℞ Vaginal Suppositories of Boroglycerine.
DIRECTIONS: Insert one into the vagina each night and morning; apply pad to vagina, because the suppository will melt.

Vaginal injections must always be given with care, lest serious injury be inflicted on that organ or the womb by a wrong or improper procedure. The best method is to suspend the bag containing the hot water from a nail in such a manner that the vessel containing the fluid is not more than two or three feet above the body; then introduce the nozzle into the vagina. Do not suspend the vessel with the hot water more than two or three feet above the level of the other end of the tube, as the higher the vessel is suspended, the greater the force of the flow from it, and if the vessel be suspended from a greater height than that mentioned above, serious injury is likely to be inflicted upon the womb, as a result of the great force with which the stream will enter the vagina. The nozzle of the tube should always be greased with vaseline.

The following prescriptions are recommended as douches:

℞ Sulphate of Zinc two ounces
DIRECTIONS: One teaspoonful in two quarts of warm water, and use as a douche, twice a day.

Or:

℞ Tannic Acid two ounces
Boric Acid two ounces
Mix.
DIRECTIONS: Two tablespoonfuls in two quarts of warm water, and use as a douche, twice a day.

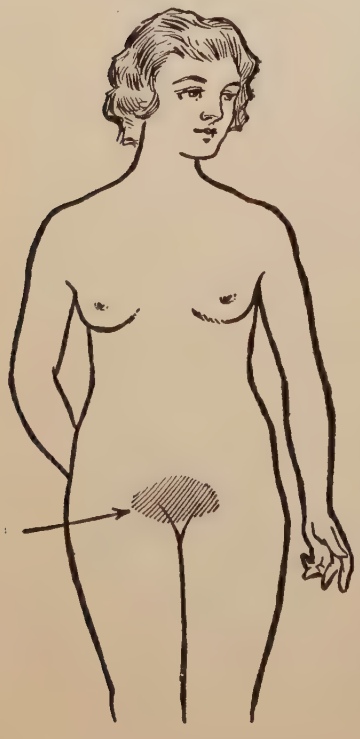
For constipation, which is almost sure to follow, inject into the rectum one pint of tepid water to which one tablespoonful of castor-oil or sweet-oil has been added, and retain it as long as possible; this is preferable to giving purgative medicines.

All stimulants should be avoided and very little food should be taken until the inflammation has been subdued.

In addition to the local means, the general treatment is of very great importance. Avoid sedentary habits, over-heated rooms, and all stimulants; live as much as possible in the open air; take cool shower-baths and strengthen the frame by moderate exercise. With these constitutional means the local treatment seldom fails even in the most obstinate cases. Furthermore, it is quite necessary to persevere for some time with the remedies, for the disease is very obstinate and slow to yield, and unless it be thoroughly cured a relapse is likely to occur.

The following tonic is recommended:

℞ Compound Tincture of Gentian.....two ounces
Dose: One teaspoonful in half a glass of water, twenty minutes before meals.



ACUTE INFLAMMATION OF THE WOMB—METRITIS

Definition.—Acute inflammation of the womb generally arises from sudden arrest of menstruation when it occurs in the non-impregnated state of the womb.

Causes.—The general causes of this inflammation are abortion, lacerations of the womb, getting out of bed too soon after delivery, displacements of the womb, suppression of menses, and excessive sexual intercourse.

Symptoms.—The symptoms of acute inflammation of the womb are similar to those of acute ovaritis, namely, severe pains in the lower part of the abdomen, weight in the pelvis over the area as shown by the shaded lines in the accompanying figure, fever, and constant nausea. It is essential that

there should be a thorough examination in order to ascertain the presence of this affection. The vagina will be found to be hot and dry; the neck of the womb is swollen and often sensitive, while the body of the womb is exceedingly painful, nausea being caused by the slightest touch. Nausea is a very frequent symptom in affections of the womb, due to the close sympathy that exists between the womb and the stomach. At the beginning of pregnancy nausea frequently occurs, thus demonstrating the sympathy of the stomach with the changes that are going on in the womb.

In acute metritis the passages of the feces are attended with excruciating pains, as the womb lies just above the rectum, and in passing the feces lift it up. Acute metritis usually ends in complete subsidence of the inflammation in from five to ten days. This disease rarely ends fatally, but unless treated promptly it may degenerate into chronic metritis, which is an exceedingly wearing and painful affection. This is likely to occur if the acute disease is not early recognized.

Treatment.—The treatment of this disease consists in applying large thin poultices to the lower abdomen, or warm fomentations if the abdomen should be too tender or sensitive. Mild saline aperients should be given to cool the general system and to soften the feces so as to prevent their irritating the womb. Rest in bed is absolutely essential. An ice-bag applied to the abdomen usually has a beneficial effect.

The following should be taken regularly:

℞ Fluidextract of Viburnum two ounces
Dose: One teaspoonful in a wineglass of cold water, every three hours.

Diet.—The diet should be of a liquid nature, and all solid foods, at least those leaving a large residue, should be avoided while the disease is in an acute stage.

Chronic Metritis.—The following symptoms are recognized in chronic metritis. There is a dull, deep-seated pain in the lower part of the abdomen, just below the pubic bone; also constant pain in the loins and region of the sacrum, extending down to the inside of the thighs. These pains are increased by walking and are accompanied by an oppressive feeling of weight in the region of the pelvis. Upon a finger examination of the vagina a sensitive protuberance or projecting part is felt on the surface behind

the body of the womb, sometimes smooth and sometimes irregular and knotty, and intense pain and nausea are caused by pressure.

As the womb is very delicately balanced in the pelvis, any increase of weight in one part causes it to incline in that direction; it is therefore retroverted or turned back and lies on the rectum, thus causing very obstinate constipation and intense pain from the passing of the feces; there is also generally some leucorrheal discharge.

The constitutional symptoms are headache, want of sleep, unpleasant dreams, foul tongue, lack of appetite, and dyspepsia.

No affection is more strongly marked by pallor and lack of strength and spirit (which are characteristic of inflammatory diseases of the sexual organs, and hence termed the uterine face) than chronic metritis, for the patient looks worn out by continuous sufferings. Although this malady is most exhausting and distressing, the patient may seem, to any superficial observer, to be in tolerably good health. During the menstrual periods all pains are considerably increased and cause much agony.

This disease, like all inflammations in tissues of low vitality, such as bones, ligaments, and the like, is of an exceedingly chronic and obstinate nature. It is intensified by the periodical congestion of menstruation; in fact, it has been asserted by specialists of experience that a case of chronic metritis is never cured spontaneously as long as menstruation lasts. Many patients supposed to be suffering from irritation or displacement of the womb or from functional dysmenorrhea had really been suffering from chronic metritis for years. The cause of this most painful disease, in most cases, is the result of an attack of acute metritis, which is not entirely and thoroughly subdued. It may also result from the extension of inflammation from an ulcerated neck of the womb, and if so, is of a peculiarly obstinate nature.

Treatment.—Should there be ulceration of the neck of the womb, this must first of all be cured, for in these cases the obstinacy and tenacity of the disease is extreme, and many months may be required to render a successful treatment.

The patient should rest in a reclining position and use astringent injections into the vagina. The constipation which accompanies this disease is almost always obstinate and difficult to treat. Injections of an enema usually occasion very intense pain

and can therefore not be used; if, however, the patient is able to endure them, it is a very favorable sign. Mild aperients must be used, for by means of these, with perseverance, together with lying out in the open air when possible, tepid sponging, and other means of bracing the general health, the disease can almost always be finally cured. This depends largely upon the patience and perseverance of the sufferer, and whether or not she has the power of using the various requisite means for so long a time.

A saline aperient, any mineral water, or cascara sagrada may be given to obtain proper relaxation of the bowels. Use from three to four quarts of hot water in giving the douches, and employ a fountain syringe. The patient must also refrain from violent exercise, such as treading the sewing-machine, long walks, dancing, or long standing, although moderate exercise and short walks are permissible. The patient should rest from three to four hours daily.

The following prescription is recommended as a douche:

℞ Tannic Acid one ounce
Boric Acid one ounce
Carbolic Acid ten drops
Mix.
Directions: One teaspoonful in two quarts of warm water, and use as a douche.

As a mild purgative, the following may be taken:

℞ Sweet Cascara Sagrada two ounces
Dose: Two teaspoonfuls in a little water, each night.

Five grains of iodide of potassium in a wineglass of water, taken after each meal, has been found beneficial.

Diet.—The diet of the patient should consist mainly of liquids, fresh fruit, gelatine, etc.

ULCERATION OF THE NECK OF THE WOMB

Definition.—Inflammation of the neck of the womb occurs more frequently than any other inflammation of the womb, and is considered a very serious disease, being the chief cause of falling of the womb, hemorrhagia or flooding menstruation, abortion,

painful menstruation, leucorrhea, barrenness, and chronic metritis.

Causes.—This affection consists of an ulcerated and inflamed condition of the mouth of the womb and the surface of the cervix or neck. There is a variation in the size of the cervix or neck of the womb in different women, but notwithstanding its size, shape, or direction, it can only be regarded as healthy if it is not inflamed or hardened. The organ is of a pale rosy hue when healthy, feels soft and elastic, and no pain is experienced on pressure. Before puberty, the womb is dormant and very little subject to inflammation; when that stage has been passed, however, the secretion of the menses is liable to be prevented, lessened, increased, or arrested by various causes. Ulceration is at times found in virgins; it is much more common in married women, sexual intercourse being often the cause. As a matter of fact, in some very susceptible women ulceration follows almost immediately after sexual intercourse. Soon after marriage many young women become victims of this disease, remaining permanently barren, or subject to abortion should conception take place.

In childbirth the mucous membrane lining the mouth and cavity of the neck of the womb is likely to be bruised and lacerated or torn, sometimes causing ulceration; under favorable conditions such contusions heal rapidly, but ulceration is likely to follow should there be any cause to prevent rapid healing, such as the retention of remnants of the afterbirth.

This disease is more prevalent among women who have borne children, the womb always remaining more vascular, that is, consisting of more vessels. Leucorrhea and gonorrhea are also frequent causes.

Symptoms.—The neck of the womb becomes swollen and enlarged and by reason of its increased weight falls into the vagina. This is a general symptom of inflammation, preceding ulceration.

A valuable aid in diagnosing the trouble is that the mouth is always open when there is inflammation in the cavity of the neck, the mouth being invariably contracted during its healthy condition. When the mucous membrane which lines the cavity of the neck becomes inflamed, it is of a dark red hue, with secretion and discharge of pus and a glairy transparent mucus

similar to the white of an egg. Unmistakable signs of inflammation of the cavity of the cervix or neck of the womb are the presence of the discharge referred to and an open mouth. Ulceration rapidly follows, presenting different characters: the granulations or healing surfaces being sometimes very small and red, or they may be large and black and blue, indicating inactivity and congestion of the part. It is difficult to detect the ulcers and they are liable to be overlooked, being never excavated nor having abrupt margins, and being soft and velvety to the touch.

Pain is felt in the loins, in the lower part of the abdomen, and in the region of the ovaries, there being no pain in the neck itself. These pains are permanent and never absent; backache occurs at intervals, due to weakness. The backache causes agony, as though the back were broken, while the pains in the abdomen are usually of a dull, aching character; menstruation becomes disordered, being either too scanty or too abundant or else irregular. During menstruation all of the pains become decidedly aggravated, causing much suffering to the patient. As a matter of fact, ulceration of the womb causes extremely painful menstruation in many cases. It also causes barrenness, and should the patient conceive, pregnancy is painful and laborious and abortions occur frequently. The cure of the ulceration often overcomes the sterility. Ulceration, like many other inflammatory conditions of the womb or ovaries, deadens the sexual feelings, so that one of the best indications of a cure is the return of the sexual desire in this, as well as other sexual disorders, on the same principle that proof of the healthy condition of the stomach and general system is given by the return of a healthy appetite.

This disease sometimes exists from ten to twenty years without endangering life, tending to be of indefinite duration and seldom subsiding spontaneously before the decline of menstruation or change of life. No other disease has been more generally overlooked, the leucorrhea, backache, and other symptoms being considered to be due simply to weakness. As previously stated, ulceration of the cervix frequently occurs in virgins, and many severe and prolonged cases of painful menstruation, as well as leucorrhea, are due to it. Scruples on account of modesty must therefore be overcome (notwithstanding that these cases are of

a very delicate nature) in order that many a young woman may be saved from an early decline in life.

After the cessation of the menses, or change of life, ulceration frequently occurs, and is generally the remains of former diseases, as menstrual decline does not always overcome the inflammatory diseases of the womb, although it is generally known to do so.

The ulcerations are more difficult to cure when they occur in advanced life—sometimes due to gonorrhea—than when they occur in young women.

Treatment.—Experience has shown that this disease rarely subsides spontaneously while menstruation lasts, but tends to continue indefinitely if left to itself, but there has rarely been a case that has not yielded to proper medical treatment. In fact, notwithstanding how great the debility or protracted the sufferings, the disease may in most cases be remedied and the patient restored to health and strength. The first requisite in treating ulceration of the neck of the womb is to subdue the inflammation.

In slight ulcerations, astringent injections are of considerable value and often result in effecting a cure. The specific treatment for ulceration in severe cases is cauterization. It is found that the ulcers generally pass into the cavity of the cervix or mouth of the womb, thus being beyond the reach of injections, and such treatment is often ineffective, whereas relief is given immediately by cauterization.

Great relief will be found from the use of the following injection daily, as until the ulcer is perfectly healthy, no matter how far the healing process had developed, if left to itself it will fall back again.

℞ Alum one-half teaspoonful
Zinc Sulphate one-half teaspoonful
Mix.
Directions: Dissolve in one quart of water, and use as a douche every night before retiring.

The last part of the ulcer to heal is that which dips into the cavity of the neck of the womb, and it is necessary that the mouth be opened and the ulcer cauterized.

GRANULAR DEGENERATION OF THE NECK OF THE WOMB

Definition.—This is an ulcer or erosion of the cervix, and is found as a complication of affections of the uterus where leucorrhea is a prominent symptom. The mucous membrane becomes irritated from the discharge from the womb. It results from anything which causes congestion of the uterus, such as immoderate coitus, displacements, and habitual constipation. In some cases it comes from the use of a pessary. Occasionally it is seen in virgins, but usually it occurs in women who have borne children. In these latter cases the condition may be complicated by a laceration of the cervix.

Symptoms.—In simple, uncomplicated cases, there may be no evidence of the presence of the disorder beyond leucorrhea. In cases, however, associated with cervical endometritis or displacements, there is another train of symptoms: pain in back, dragging sensation in the pelvis, profuse leucorrhea, and intense nausea. Hemorrhage occurs very easily, and frequently abortion follows from the excessive irritation. This condition is usually increased on standing or walking.

Treatment.—This will differ materially, depending on the severity and complications. In the majority of cases the use of astringent douches cures the condition. An excellent douche is as follows:

℞ Zinc Sulphate two ounces
Boric Acid two ounces
Mix.
Directions: Two teaspoonfuls in two quarts of warm water, and use as a douche.

If the condition is of long standing, there usually is some other primary condition, as endometritis, and it is necessary to cure this condition at once.

Abdominal supporters are valuable to carry the weight of the uterus. Rest is necessary, especially during menstruation, and regulation of the bowels is important.

The general health should be carefully guarded and the diet properly regulated.

CYSTIC OR FOLLICULAR DEGENERATION OF THE CERVIX

Definition.—This is less common than granular degeneration of the cervix, but is not an infrequent complication of chronic endometritis. Sometimes it is confused with acne of the cervix. The glands around the neck of the womb enlarge and form small cysts.

Symptoms.—There are very few signs to be noticed by the patient. There may be a mucous discharge, or else the glands may occlude the neck of the womb. This condition is usually found by examination with the speculum.

Treatment.—The condition is best treated by a physician, who will usually puncture the cysts to let out the fluid, and order a vaginal douche. If the condition does not improve, the parts should be touched with a silver-nitrate pencil.

HYPERTROPHIC ELONGATION OF THE WOMB

Definition.—This is most frequently associated with prolapse of the uterus. It is most frequently found in women who have borne children. The body of the uterus is normal in size, but the neck of the womb projects down into the vagina.

Symptoms.—There is leucorrhea and the mucous membrane is all eroded. The menses are profuse and very painful. Sexual intercourse is very painful, and often impossible because of the enlargement. Retroversion is often a complication and increases the symptoms, with constipation and headache.

Treatment.—In most cases the enlargement is so great that local treatment is without avail. The best treatment is surgical, in which the neck of the womb is amputated. Before the operation, the patient's general health should be built up by rest and diet. This condition should never be neglected for a long time, because it may become malignant.

LACERATION OF THE CERVIX

Definition.—This condition is not an infrequent result of parturition, the cervix being torn in one or more places. It is

important because of its many complications. Slight laceration is called a fissure.

Symptoms.—The only indication of laceration of the cervix during labor may be hemorrhage, persisting when the uterus has contracted. It may be only a brown oozing, or else a bright red, profuse hemorrhage. If the wound heals up at once, there may be no more signs beyond the primary hemorrhage. If the cervix does not heal up, the woman will have trouble for a long time. There are bearing-down pains present, weight in pelvis, pain in back, discharge, and often hemorrhage, with a loss of sexual desire. This condition also affects the nervous system; the patient is unable to sleep and easily becomes hysterical. Sterility is a very frequent but not invariable result, depending upon the direction of the laceration.

Treatment.—If laceration of the cervix should be suspected or detected at the time of parturition and hemorrhage be a prominent symptom, a lump of ice may be passed up the vagina to the cervix. Ergot should be given to the woman in order to aid the contraction of the uterus. Tampons moistened with glycerine often give relief. The best treatment is surgical, in which a few sutures are used to sew the edges of the lips together. This is a condition which should not be neglected, and often requires the close attention of a physician. If the laceration is small, the application of a caustic pencil stops any oozing and heals up the surfaces.

TUBAL PREGNANCY

Definition.—When pregnancy takes place in the oviduct and not in the cavity of the womb, it is known as tubal pregnancy. When the ovum, or female egg, is obstructed in its passage into the womb through the Fallopian tube and does not descend into the womb where it can become impregnated by the male germ, the male germ takes an upward course through the womb into the Fallopian tube, where it encounters the female ovum, which latter becomes impregnated in this abnormal position. The egg becomes increased in size and swollen, and consequently the tube expands gradually until it bursts, with the result that a hemorrhage takes place in the cavity of the abdomen.

Causes.—The morbid or unhealthy condition of the tube in which the ovum became obstructed is the primary cause of this condition.

Symptoms.—In tubal pregnancy the symptoms are almost entirely similar to those of normal pregnancy. Very prolonged barrenness commonly precedes tubal pregnancy. The woman who has formerly menstruated regularly will miss a period, and upon examination, if tubal pregnancy has taken place, the uterus will be found to be to a considerable extent enlarged.

Pains similar to cramps will be felt in the lower abdomen; the womb will be slightly enlarged, with a mass or bunch at one side of it where the pain is located. The pregnant tube becomes much dilated, bursting in from five to nine weeks owing to the gradual and continual growth of the embryo, should the latter not be removed. Hemorrhage from the womb and vagina is also present, and in some women the commencement of the pain and hemorrhage is most excruciating and intense and followed by inflammation and sickness. In the event of tubal abortion or a bursting of the tube, there is always intense pain in the abdomen, sharp and sudden at first, followed by spells of fainting, and the condition becomes quite precarious, with death likely to result, owing to the great loss of blood.

Treatment.—There is no diversity of opinion among the medical profession regarding the treatment necessary in this unusual condition. Medicines are of no avail, and the only chance for saving a patient's life is by a surgical operation, which should be performed before the rupture or bursting of the tube; however, should the rupture take place before summoning a physician, there is still a good chance for recovery if the operation is performed immediately, in order to arrest the bleeding by tying the ruptured vessels, freeing the abdomen of clots by washing them out, and removing the sac with the fetus.

FALLING OF THE OVARY

Causes.—This malady is the result of enlargement of the ovary, caused by a tumor or inflammation. The downward fall of an ovary is likely to follow a wrong step or fall, causing inflammation to set up in the ovary.

Symptoms.—Deep-seated pains in the pelvis, either dull and aching or sharp and shooting, are symptoms of this affection. There is frequently pain when the bowels move, and sexual intercourse is attended with considerable pain and, at times, nausea.

Treatment.—It is very seldom that it is possible to avoid removal of the ovary in such case, but some degree of relief can be derived by the use of hot vaginal douches. Operations in many cases are necessary, although relief and in many cases permanent cures can be obtained by the advice of the physician and use of pessaries.

As a douche, the following is beneficial:

℞ Sulphite of Zinc one ounce
Powdered Boric Acid one ounce
Mix.
DIRECTIONS: One teaspoonful in two quarts of warm water, to be used night and morning.

ACUTE OVARITIS

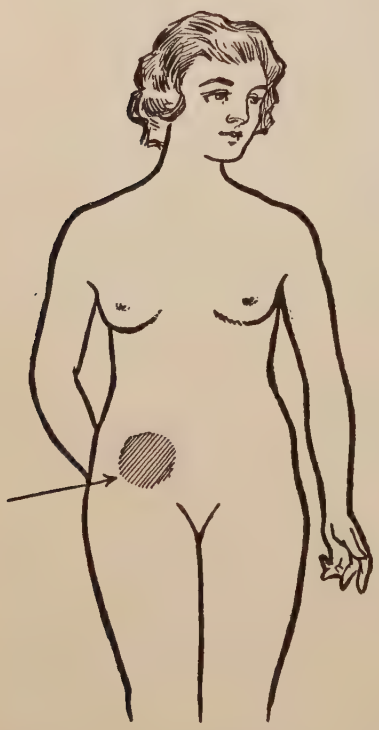
Definition.—This condition, which is an acute inflammation of the ovary, while common in the period immediately following childbirth and when inflammation of the sexual organs is likely to occur, often occurs at other times. It is an affection which is often confused with inflammation of the womb, with iliac abscess, or with inflammation of the bowels.

Causes.—Sudden suppression of the menstrual flow, due either to cold or violent mental emotions, is a cause of this disease, the symptoms being similar to those of inflammation of the womb. After confinement, acute inflammation of the ovary is liable to occur, due to various causes, among which are: exposure to cold too soon after confinement; arrest of the secretion of milk; the use of a cold instead of a hot vaginal douche; plunging into cold water for a bath; remaining in a draft after the body has been overheated; and blood-poisoning after miscarriage or delivery.

Should ovaritis result from the arrest of the milk secretion or too early exposure to cold, it usually involves the peritoneum, resulting in very dangerous complications which

generally end fatally. However, when this disease is caused by the sudden arrest of menstruation in the unimpregnated womb, the peritoneum is very rarely involved.

Symptoms.—A feeling of weight and uneasiness in the pelvis, severe deep-seated pains in the lower part of the abdomen, pains in the loins, and tenderness to touch over the position of the inflamed ovary (over the area indicated by the shaded lines in the accompanying figure), are among the symptoms, fever also being present, with a hot skin and quick pulse.



Unless very active treatment is given, ovaritis usually proceeds to suppuration, in which case matter forms and later escapes through either the vagina or the rectum, the most favorable course being through the vagina and the pus causing but little irritation there. Should the abscess open into the rectum, greater irritation results, with dysentery and griping pains, frequently lasting a number of days.

After the discharge of the pus a decided improvement is noted and the patient is considered to be convalescent; however, the disease is by no means completely cured, as a chronic state of inflammation still continues, excited afresh with each return of menstrual congestion, at which time additional matter gathers and former symptoms are repeated. This condition may continue for a year or more, the patient suffering in the meantime from chronic inflammation of the sexual organs, with pain and weight in the pelvis, pain in the back, tenderness in the ovarian region, inability to walk much, and disorders of menstruation.

When the disease is recognized in the beginning, suppuration can in a number of cases be prevented by active treatment, and should it occur at all, the lingering remains of the inflam-

mation can be overcome by the employment of decided and effective methods.

Treatment. During the attack an important factor is that the patient should remain in bed, completely at rest, and if the condition of the skin permits, an ice-bag should be placed over the affected ovary; should she be unable to endure this by reason of the extreme sensitiveness of the skin, a hot flaxseed poultice or a hot-water bag should be applied. It is important also that the bowels be kept open with saline aperients.

Should the inflammation pass to the chronic stage, the local treatment should be continued for several weeks, at the same time using hot vaginal injections. Much benefit has been derived from the following prescription, taken as directed:

℞ Fluidextract of Viburnum one fluid ounce
Tincture of Gelsemium.....two fluid drams
Peppermint-water six fluid ounces
Mix.

Dose: One teaspoonful every two or three hours.

The following injection should be used if leucorrhea be present:

℞ Tincture of Iodine two ounces
Directions: Add one teaspoonful to one quart of water, and use as a douche morning and evening. This should be continued for some time.

Or:

℞ Boroglycerite Suppositories.
Directions: Insert one morning and night.
Douche thoroughly before inserting.

An operation will no doubt be necessary should the treatment as outlined herein not be effective in remedying the disease.

SUBACUTE OVARITIS

Definition.—More common than acute ovaritis in subacute ovaritis, as in the latter the entire ovary is not affected as a general thing, the inflammation being limited to certain parts.

Causes.—Excessive sexual intercourse is the chief cause of subacute ovaritis, sometimes produced in newly married women

and particularly in prostitutes, whose ovaries always, after death, present some morbid lesion or hurt. Other causes are privation of the sexual stimulus, whether absolute privation or sudden withdrawal (both leaving the ovaries in a congested state); late marriages, in which the sexual stimulus is likely to prove too powerful for the ovaries, which are unaccustomed to it. The decline and arrest of menstruation are likely to be followed by this disease, as well as dysmenorrhea, gonorrhea, leucorrhea, and kindred maladies.

By reason of its great frequency and the difficulty in its diagnosis, subacute ovaritis is a very important malady. It is often the hidden root of various miserable diseases which, before successful treatment can be effected, it is necessary to cure in order to relieve the ovarian inflammation. A number of cases of amenorrhea, menorrhagia, dysmenorrhea, sterility, and hysteria are due to this disease, and it is necessary in all these affections that a careful examination be made, should there be any symptoms of ovaritis.

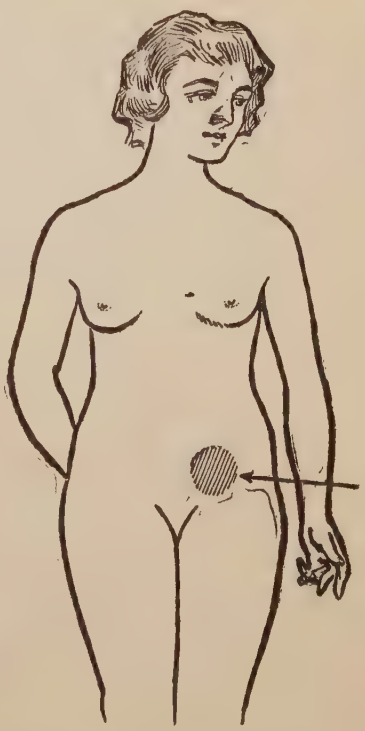
Symptoms.—The symptoms are dull pains in the ovarian region, which are increased by walking, riding, or pressure on the part and by straightening the leg. The pains radiate from the ovaries to the loins, thighs, and anus, and are of a dull, dragging, and sometimes overwhelming nature. They are considerably increased by sexual intercourse.

Like other inflammatory conditions of the ovaries and womb, this distressing affection exercises a deadening influence on the sexual organs and very frequently causes hysteria. It also frequently causes various disorders of menstruation, either directly or by causing a secondary congestion or inflammation of the womb, the healthy state of which depends in a very great measure upon the condition of the ovaries. It also produces sterility, which condition has more often been known to arise from diseases of the ovaries than of the womb, although the general opinion is quite to the contrary.

The morbid and diseased appearances so commonly found in the ovaries after death and which are caused by subacute ovaritis, are a red and inflamed state of the Graafian vesicles, which are sometimes full of pus and also frequently swollen to the size of a pea, indicating a state of chronic inflammation. The Fallopian tubes are frequently found bound down by adhesions,

a very frequent condition in prostitutes and a cause of their general barrenness.

Treatment.—A mustard or belladonna plaster or other blistering agent should be applied to that part as shown by the shaded area in the accompanying figure, in order to break down the chain of nervous action; also the rubbing in of a salve composed of an ounce each of mercury and belladonna ointment. The bowels should be kept open by means of the following cathartic:



℞ Epsom Salts
one or two teaspoonfuls

DIRECTIONS: Dissolve in a little warm water, and take in the morning, on an empty stomach.

Should the bowels be very costive, the following enema will be found effective:

℞ Olive-oil . four fluid ounces
Glycerine . two fluid ounces
Mix.

DIRECTIONS: Inject into rectum. Follow in one hour with a hot solution of soap-suds.

A permanent cure may generally be effected by the means herein outlined, which can only be employed during the menstrual intervals; after which a boracic acid solution injection should be given morning and evening. Sexual intercourse should be abstained from and a healthful, regular life led during the course of the treatment, and for some time after the treatment has been effective it is necessary that sexual intercourse should be moderate. After the disease has been eliminated by the treatment, the various menstrual and hysterical affections will disappear, as will also barrenness.

PYOSALPINX

Causes.—This disease is caused by ovaritis which has developed into a chronic state, resulting in the formation of pus in the ovary and ovarian tube.

Symptoms.—The pain is low down in the abdomen in the region of the groin and sometimes shoots down the leg of the affected side, often extending into the back and hip and followed by chills and fever. The abdomen also becomes sore to the touch.

Treatment.—The removal of the affected ovary and tube is the only effective measure to be adopted, as no local treatment will avail in cases of pyosalpinx. Women suffering from this malady should be warned not to neglect early medical treatment, delay being very often dangerous and resulting in loss of life.

SIMPLE OVARIAN TUMORS

Definition.—The simple or ovarian cysts are organized sacs containing fluid, which grow from one part of the ovary itself. They begin their growth as small vesicles, but no limit can be mentioned as to their ultimate size; they may grow until they fill the abdomen. Occasionally, two or more of these cysts form at the same time. They contain a clear fluid and the walls may be thick or thin. With this, the uterine tube becomes enlarged.

Symptoms.—There is a great variety of symptoms, depending on the size and nature of the cyst. These cysts may not be noticed before puberty, but at this time their growth is more rapid. There is a feeling of weight in the abdomen, with irritation of the bladder and constipation. The diagnosis is best made by examination through the vagina.

Treatment.—When the diagnosis has been definitely made, the only cure is an operation. In this the cyst is extirpated, and in many cases with severe adhesions it is necessary to take out the ovary with it.

CANCER OF THE OVARY

Definition.—This is a malignant tumor of the ovary, which may occur as elsewhere in the body, or else spread to the ovary from some adjacent part. The tumor grows; because of its rapid growth the inside is not nourished and becomes soft and partly liquid.

Symptoms.—The patient becomes weak and anemic; pains develop over the sides of the abdomen. The tumor grows very rapidly and it causes the abdomen to become pendulous. Because of this rapid growth, many women think they are pregnant and often neglect the condition for months.

Treatment.—The only cure for this condition is an operation, and in this the surgeon usually takes out all the female organs in order not to have the condition come back. The operation should not be postponed, and the patient should have good, nourishing food, with plenty of fresh air.

PAINFUL AFFECTIONS OF THE BREAST

Nervous women are peculiarly subject to painful and pricking sensations in the breast, although the glands are evidently not in a condition which would indicate any organic disease to be present. The pain at times is very intense and almost unendurable, and in some instances is so extremely severe as to arouse a fear, in the patient's mind, of cancer.

Treatment.—By taking the breast (which in such cases is quite relaxed) and stretching it with both hands and in both directions, the same as if it were an elastic or rubber ball, and especially manipulating the tender parts, the pains may to a considerable extent be allayed and frequently entirely removed in a relatively short period. This treatment should be continued until the glands have been entirely manipulated, and the process repeated as often as may be found necessary; the breast should afterward be covered with hot fomentations and wrapped in absorbent cotton.

The following prescription is recommended to be used, night and morning:

℞ Glycerite of Tannin two ounces
DIRECTIONS: Massage about one teaspoonful on each breast, very gently.

ABSCESSES OF THE BREAST

Definition.—Abscess of the breast is invariably the result of inflammation which has not been allayed or has not subsided, being a localized collection of pus which is surrounded by a wall of lymph.

Causes.—This condition may occur after any confinement, but most often occurs after the first pregnancy. Other causes are: irritation from sore nipples; too great congestion of the breasts, which is a frequent occurrence while the flow of milk is being established; and exposure to cold.

Symptoms.—The patient is hot and feverish and the pulse rapid at the commencement of the inflammation. There is also thirst, headache, and pain in the affected breast; the breast becomes distended, hot, and painful to the touch. The patient also has shivering fits followed by fever and sweating, as soon as pus is formed.

Treatment.—Should it be found that suppuration has begun, apply hot flaxseed or linseed meal poultices, and renew them as soon as cool. If there should be unmistakable signs of pus present, the breast should be opened with a lancet by a physician and its cavities emptied or drained. It is much more advisable that the abscess be opened early than to allow it to break; this will not alone save the patient much pain but will give the pus an outlet and prevent the abscess from spreading or becoming more deeply embedded.

The breast should be well supported so as to prevent it from hanging, and for this purpose use long strips of adhesive plaster, which must be carried around the neck and below the breast.

Apply a weak solution consisting of ten grains of nitrate of silver and one ounce of soft water, twice a day, if the ulcer be long in healing. Saline purgatives should be used to keep the bowels open and the diet confined to farinaceous foods. After the abscess has been opened and as long as there is a discharge from the breast, the patient should be kept on a more nourishing diet and tonics. An excellent tonic is the following:

℞ Elixir of Iron, Quinine, and
Strychnine four fluid ounces
Dose: One teaspoonful in a little water, before meals.

PHYSICAL CULTURE FOR WOMEN

INTRODUCTION

PHYSICAL CULTURE should not be practised for the purpose of muscular development only, but with the idea of keeping the body in a good healthy condition, and especially should this be done among the female sex. What is needed mostly in women is exercise that will tend to bring into action all parts of the body and also the generative organs so as to keep them in an active and healthy condition. The proper exercise will make the body firm, produce the elastic springy step to the carriage instead of the common, usual, awkward movements, and will develop a symmetrically well rounded form.

Constipation is the greatest enemy to women's health. It has been estimated that ninety per cent. of the women suffer from this malady and there has been one chief reason established by the medical profession for this cause, and that is the lack of proper bodily exercise which will bring the liver and bowels into action. This is just what the following exercises are intended to do, and if faithfully carried out, a few minutes every day, will do more to benefit the general health than all the drugs in creation.

BREATHING EXERCISES

The Various Kinds of Breathing Exercises.—All impediments to the free movements of the chest must be removed. The air which enters the lungs should be as pure as possible, more especially since in deep breaths any impurities that may be inhaled will be drawn deeply into the lungs. In the first place, normal breathing takes place through the nose, the ingoing air being

thereby warmed, moistened, and filtered. Seeing what an important part the nose plays in preparing the inspired air, it is imperative that there shall be no nasal obstruction.

Two types of respiration are recognized: the *costal,* produced by movements of the ribs, and the *abdominal,* produced by the action of the diaphragm. The individual must first learn the difference between costal and abdominal breathing, since each has its own peculiar effects.

Abdominal breathing is best learned lying on the back. Concentrate attention on the abdomen, seeking to protrude it to the utmost with every inspiration, and to keep the chest fixed. Now retract the abdomen to its fullest possible extent.

Costal breathing must be practised both in the horizontal and upright postures, the attention being concentrated on the ribs, and these should be raised to the utmost, while at the same time every effort is made to keep the anterior abdominal wall stationary.

Active Breathing Exercises.—(1) Take the fullest possible costal inspiration, followed by an ordinary expiration.

(2) Expire to the utmost, bending the body somewhat forward, and then take an ordinary inspiration, resuming the vertical position.

(3) Take the fullest possible costal inspiration, and then expire to the utmost, bending the body forward.

(4) Stand with the legs well apart, and take a deep abdominal inspiration, followed by a passive expiration, that is, one resulting from recoil merely.

(5) Stand with the legs well apart, and take a deep abdominal inspiration, followed by a deep abdominal expiration.

(6) Sit down. Fold the hands on the lap; bend the body forward as far as possible. Now take the deepest possible abdominal inspiration with closed mouth, and then gradually raise the body, lift the arms over the head, and take the fullest possible costal inspiration. After this, passively expire, by recoil merely, with open mouth, allowing the arms to drop suddenly. Expiration should not proceed beyond the limit of ordinary expiration, and should not occupy more than one second, inspiration occupying not more than six seconds.

Breathing Exercises Combined with Other Exercises.—In this way groups of muscles may be strengthened at the same time

that the person derives the special advantages to be had from increased respiratory activity. The individual stands. Inspiration should be taken through the nose, expiration through the open mouth. The former long, the latter short.

(1) The arms, held stiff, are swung round as far as possible in the open manner. Inspiration accompanies the upward movement, expiration the downward movement.

(2) The arms, held stiff, are moved from the side of the body outward to the vertical, and then returned to the original position.

(3) The arms are bent at the elbows and held close to the sides. They are moved upward, and extended to the vertical with inspiration, being returned to the original position with expiration.

(4) The arms hanging down, the hands are moved upward into the armpits as far as they will go, the elbows moving outward. They are then returned to the original position.

(5) The arms, held horizontally in front of the body, are swung backward in the horizontal plane as far as they will go, and then returned to the original position.

(6) While the hands rest upon the hips, with the thumbs behind and the fingers in front, the elbows are moved backward as far as they will go, and then returned to the original position.

(7) The arms, held horizontally forward, are swept downward and backward as far as they will go, the body meanwhile bending forward, the original position being then resumed.

Advantages Derived from Breathing Exercises.—Breathing takes place by means of movements of the ribs and diaphragm—a flat muscle which separates the chest from the abdomen. During inspiration, the ribs are elevated and the diaphragm descends; during expiration, the ribs descend and the diaphragm ascends.

Breathing exercises stimulate the flow of blood through the lungs, and thus facilitate the excretion of waste products, and they do more than this: they tend to keep the chest-wall mobile, a very important consideration in view of the fact that as one gets older the chest tends to become rigid. This is one of the troubles in connection with the "winter cough" of the elderly, for an immobile chest means that the expectoration cannot be

got rid of. Not only this, but with a mobile chest "winter cough" is much less liable to occur.

They are also of great use in all *chronic affections of the lungs*. The more perfectly developed the lungs and the more mobile the chest-walls, the less the tendency to bronchitis, pneumonia, and consumption. Nothing is more certain than that small, ill-developed lungs are prone to tuberculosis. Not only do good lung development and chest mobility tend to prevent lung disease, but they place the individual at an advantage should he happen to develop it. In *asthma* the effect of breathing exercises is often striking.

In *heart disease* the exercises are often of marked benefit, for by aiding the circulation of the blood they relieve the work of the heart, and thus conserve its energy.

Great benefit can be derived from breathing exercises in *functional diseases of the nervous system*. By accelerating the flow of blood through the brain they not only increase the supply of oxygen, but they also promote the withdrawal of waste products.

Disorders of digestion can often be greatly benefited by breathing exercises. It must be remembered that general muscular exercises, such as walking, running, cycling, cause a wide-spread effect on the circulation, the blood-flow to the abdominal organs being lessened. Hence it is that active muscular exercise after a meal tends to retard digestion. Suitable breathing exercises cause an increased flow of blood to the abdominal organs, improving the secretion of the digestive juices, as well as stimulating the liver, stomach, and intestines. In the treatment of constipation they are often of marked benefit.

It is well known that *obesity* is predisposed to by defective oxygenation of the tissues. Breathing exercises, by increasing the oxygen in the blood, tend to induce fat-absorption.

It is believed that many cases of *stammering* are due to faulty breathing, the diaphragm being the muscle chiefly at fault. Such cases often yield to breathing exercises systematically carried out.

An old-fashioned remedy for *hiccough* is to hold the breath for a time. The best plan is to take a series of rapid breaths, "holding the breath" at intervals for as long as possible.

Deep breaths are very helpful in promoting *sleep*.

EXERCISE I

This exercise represents the simple breathing exercise which is essential to everyone, even if it is not possible to indulge in the other exercises. Stand in an erect position, feet together, hands on the hips, as shown in Illustration No. 1. Take a long, deep breath, filling the lungs to their capacity, and throw the shoulders back. Try to see just how far you can push the chest forward. This deep breathing will not only increase the size of your chest, but it will give you more energy and also keep the blood purified. Every time you think of it, and especially when you are out of doors, take long deep breaths. It will also be advantageous to do a little deep breathing with all the exercises set forth in these lessons.

EXERCISE II

Take the same position as for Exercise I. Rise up and down on the toes, as shown in Illustration No. 2. This is a standard exercise to round out the calf of the leg and give it a pleasing shape. This movement should be performed until the calves begin to ache. A graceful-looking ankle always goes with a well shaped calf, and this exercise will give you both. In order to make this exercise a little more strenuous, and tire the calves quicker, naturally saving time in acquiring the desired results, the exercise can be done by standing on one foot at a time.

EXERCISE III

Illustration No. 3 shows how easily the body can be turned or twisted to the right or the left. First twist to the right and then to the left, always facing in the corresponding direction. This will give a woman a slender waist and greatly help the internal organs. When first beginning this course of exercises, it would be well to bear in mind not to become too tired with the first lesson, and as soon as you feel fatigued, rest a few moments, and you will find that the second effort will not be so tiring. Practice makes perfect in this case as well as with anything else.

EXERCISE IV

In Illustration No. 4 the knee is brought up as close to the body as possible. Try this first with the right knee and then with the left, until slightly tired. For women suffering with weak hips or weak back this exercise will prove very beneficial and should be persevered in every day, no matter what other exercise is omitted.

EXERCISES V AND VI

In performing these exercises the person must first lie flat on the floor on the abdomen, placing the hands flat at the sides, as shown in Illustration No. 5. Then gradually push the fore part of the body up, using all the strength in the arms, until you reach the position as shown in Illustration No. 6. Relax, and resume first position, and repeat the exercise until slightly tired. This exercise will not only strengthen the arms and the back, but it will help a great deal to develop the bust. Do not forget your deep-breathing exercise while doing this feat.

EXERCISE VII

Another popular exercise to strengthen the arms and wrists is shown in Illustration No. 7. Assume a sitting position on the floor with the hands placed flat on the floor at the sides of the hips. Now try to raise the body forward until it is straight, as shown in this illustration. Lower again and repeat. This is a good all-around exercise, in which one uses nearly every muscle along the front of the body, from the neck to the feet. Repeat this exercise until slightly tired in the muscles used.

EXERCISE VIII

For those women who wish to reduce all superfluous flesh around the abdomen, the exercise shown in Illustration No. 8 should be practised. Lie flat on the floor on your back, clasping the hands behind the head. Then raise the body gradually until you assume a near sitting posture. Relax, and repeat until slightly tired. This movement will also greatly benefit the di-



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ILLUSTRATION No. 1



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ILLUSTRATION No. 20

gestive organs. If any difficulty is experienced in holding the feet down, place the feet under some heavy object, like a couch, for instance, so they will be kept steady and in place.

EXERCISES IX AND X

For those who desire a graceful carriage, nothing is better than to practise the balancing exercises as shown in Illustrations Nos. 9 and 10. The act of maintaining a balance gives control of the muscles which are used in every-day life. The first preliminary movement is shown in Illustration No. 9. Raise the knee as high as possible, keeping the toes pointed outward. Then extend the leg until the position is gained as shown in Illustration No. 10. Repeat this exercise several times with each leg. Be sure to have the shoulders well thrown back, and the chest high throughout these movements, and do not forget the deep breathing.

EXERCISE XI

Assume position as in Illustration No. 1. Bring the right leg back as far as possible, which movement will also bend the left knee, as shown in Illustration No. 11. Reverse now, bringing the left leg back and bending the right knee. Keep reversing the movement until slightly tired. This movement will give the legs a rounder shape and also benefit the hips. In changing the weight from one leg to the other, always keep an erect position between the counts, but do not hold the count too long so as to lose the rhythm of the movement.

EXERCISE XII

Another excellent exercise which will insure graceful carriage and pose is shown in Illustration No. 12. In this instance, one must first assume the erect attitude as shown in Illustration No. 1. Then swing the left leg backward and as high as possible, at the same time throwing the arms as high as they will go, but maintaining them in a horizontal position. Relax, come back to first position, and repeat the exercise, raising the right leg backward and as high as it will go. Do not get discouraged because you lose your balance in the first few attempts. This is

a difficult exercise, but the woman who persists in it will be well repaid for her efforts.

EXERCISE XIII

The muscles along the spine must be strengthened and encouraged in their particular functions, and there is no better way of doing this than by the exercise shown in Illustration No. 13. While sitting on the floor, legs straight, clasp the hands behind the head or neck and pull the head forward and down as far as possible; in fact, try to bring the head down to touch the knees, but always keep the legs straight and stiff. If you feel yourself getting too tired in the back, rest a few moments, and then resume the exercise.

EXERCISE XIV

Assume a sitting position on the floor, swing the arms forward, and grasp the feet as shown in Illustration No. 14. Keep the knees stiff and try to pull the feet upward with all the force you can muster. Relax, and repeat until slightly tired. This is another exercise which will strengthen the muscles of the abdomen and also the small of the back.

EXERCISE XV

The exercise as shown in Illustration No. 15 is a very good one for the small of the back, the abdomen, front of the thighs and hips, and also for the neck, as all these parts come into play, and each receives its share. Assume a kneeling position on the floor and bend the body backward. Gradually throw the head back, to bring the muscles of the neck into play. If the eyes are kept closed during this exercise, it will prevent dizziness which might occur.

EXERCISE XVI

Illustration No. 16 shows a very difficult exercise for those whose muscles have not been kept elastic and nimble. However, even this exercise should not discourage the novice, as it can be readily accomplished in a few good attempts. Lie on the floor on the

back, with arms stretched straight above the head, palms open. Now raise the legs and throw the feet backward until they touch the floor just beyond the hands, as shown in the illustration. If the first attempt is not successful, try it again, as each time you try, the muscles which are brought into action become stronger, and the desired result will be attained. This exercise lends grace and strength to the body and eliminates all excess flesh around the waist-line.

EXERCISE XVII

Squat down until you are sitting on your heels as shown in Illustration No. 17. Then raise yourself upward until you come to a standing position. Keep the body erect throughout this entire movement. Continue until the legs feel tired. This exercise not only will round out the knees and give the legs a pleasing shape, but will also benefit the lungs, as you cannot continue this exercise until you feel tired in the parts used without getting out of breath.

EXERCISE XVIII

A very common exercise is shown in Illustration No. 18, and almost every one can do it; but for the benefit of those who are not yet able to acquire this position, it will be well for them to practise first to bring the tips of the fingers to the floor, and then gradually work the palms of the hands down to the floor. The knees must be kept stiff and rigid throughout the entire exercise. This is another movement which will give suppleness to the body and eliminate weak backs. It should be performed at least ten times a day to get the beneficial results.

EXERCISE XIX

Go through the motions of throwing a ball, as shown in Illustration No. 19. Get plenty of action into each count. Use the feet as well as the arms and shoulders. This will limber up the joints and keep the muscles supple.

EXERCISE XX

Assume an erect position, feet together and firm on the floor. Bend backward from the waist, as shown in Illustration No. 20, as far as you possibly can, but keeping the feet flat and rigid. This exercise gives the entire back plenty of action, invigorates the muscles along the spine, and also strengthens the neck. Any one practising this exercise faithfully should have no cause to complain of a weak back.

PREGNANCY AND MOTHERHOOD

INTRODUCTION

THE natural sequence to marriage is motherhood. The moment when her first child is born is often the supreme moment of a woman's life, and to the healthy-minded woman the exultation at the birth of her subsequent children is hardly less. Many young women enter on married life with the vaguest glance forward to the great miracle of maternity, which yet is very imminent. The majority of married people have their first baby within a year of their marriage. It is but natural, perhaps, that the details of the conditions leading up to the birth of a child should then be faced for the first time. Yet it would be impossible to exaggerate the issues, physical and moral, which depend on the right fulfilment of the function of maternity, and the subject of the hygiene of pregnancy should be of the greatest interest to every young married woman.

Without showing a morbid preoccupation with herself and her symptoms, she should yet be intelligently on the watch for signs of the condition which is to be expected and desired. When convinced that she is pregnant, she should determine in the same spirit to do everything in her power to bring her child safely into the world and to give it as good a start as may be on the road of health and happiness. The physical condition of the infant depends so intimately on that of the mother that it is a duty of the expectant mother to keep herself as fit as may be, physically and mentally.

It is well for a young woman to avoid the information and advice of elderly, gossiping women, who are full of a wondrous lore on the mysteries of maternity, which consists chiefly of foolish and sometimes harmful superstitions. A young woman

will naturally consult her mother on some subjects, but she cannot do better than abide by the advice of a reputable authority. Such advice we have tried to furnish. It is no part of its purpose to overemphasize the discomforts and dangers of pregnancy. Though it must sometimes bring into prominence the painful complications which occasionally and in abnormal cases accompany the functions of maternity, the writer would at the outset insist that these functions are natural and normal, and that in the great majority of cases, where proper hygiene is observed and ordinary care taken, there is the minimum of pain and discomfort.

SIGNS AND SYMPTOMS OF PREGNANCY

The first thing a young married woman will wish to know is the signs by which she may recognize that she is about to become a mother. The earliest symptom of pregnancy is a stoppage of the monthly periods, though it is not an absolutely certain sign, as there is sometimes no monthly flow in young women owing to bloodlessness; still, if it occurs in a married woman who has hitherto been perfectly regular in her menstruation, it is a most valuable indication of pregnancy. It is also by this means that the probable date of the confinement is usually calculated.

It must be remembered, however, that in some women menstruation (or, as it is more commonly called, "periods," "courses," "monthlies," and "being unwell") persists for the first three months of pregnancy, and may thus mislead a person as to her condition as to when the baby is likely to be born. It is very rare for such periods to last the usual number of days, or for the flow to be of the usual amount. It is usually scanty, and does not last more than a day and a half.

Before describing the other symptoms of pregnancy, it would be well first to consider shortly the subject of menstruation. This is a regular flow of blood from the womb, which occurs every month, usually between the ages of fifteen and forty-five. Its occurrence indicates the passing from childhood to womanhood, and its continuance means the possibility of pregnancy taking place. After it ceases, there is little likelihood of a woman becoming pregnant. Although a girl may menstruate at the age of fifteen, it does not follow that she is then fit to bear

children, as her whole frame is as yet immature, and the bones of the pelvis are not properly developed till after twenty. The age for child-bearing is between twenty-three and thirty-five. The children of immature people are generally delicate, and resemble in some ways children who have been born prematurely. On the other hand, the children of old parents are also often delicate and wanting in vitality, as though themselves prematurely old. A woman marrying between the ages of twenty and twenty-five has, other things being equal, a better chance of bringing up a healthy family than one marrying either earlier or later.

Once menstruation is properly established, it should go on regularly, both in quantity and duration, unless there is something wrong. The usual time between the first day of one period and the first day of the next is twenty-eight days, but the time may vary between twenty-one and thirty days according to the individual. In each person, however, it should be constant in its recurrence whatever the type may be.

The periods stop in about half of the total number of women between the ages of forty-five and fifty, but the "change of life" varies between much wider ages than the onset of the periods. A continuance of menstruation beyond the age of, say, fifty-five, especially if the periods be very severe, usually means that there is some very definite cause, commonly a simple tumor of the womb, which should be attended to. Much more important, however, is a return of bleeding after the change of life has been properly established. This should always excite the gravest suspicion, and at the very first occurrence of any return of bleeding a doctor should be consulted, as it is so frequently due to the early stages of cancer. If taken early a great deal may be done, and the woman's life saved by operation; but too often, alas, no attention is paid to it, and months are allowed to elapse before a doctor is consulted, by which time the growth has made such progress that the case is utterly beyond all hope of cure. One cannot be too emphatic on the importance of this point. Of course the symptoms may arise from some minor cause, but the danger is far too great to admit of any delay. A woman who neglects such a symptom for months is virtually committing suicide, and choosing for herself a particularly slow and painful method of doing it.

At the change of life, which indicates the end of the child-bearing period, various alterations occur. They are all physically in the direction of atrophy. The breasts become smaller as regards gland tissue, though they may become more prominent owing to the tendency some women have to grow stouter at this period of life. The whole body may become markedly thinner or fatter. Internally the generative organs atrophy and become small. As there is a great readjustment going on in the system, the general symptoms are sometimes severe. Headaches and dizziness may be very troublesome. A troublesome complaint is the frequency of severe flushings of the face and body which occur at this time. At the same time the nervous system is sometimes in a very unstable state, and some women are the subjects of nervous breakdowns which may last over many months. The periods may stop suddenly and never return. More commonly there are irregularities, a month or two being missed, and then a period comes which may be normal in amount but is usually more severe. Occasionally there are very severe hemorrhages, which gradually get less till the "menopause," as doctors call the final ceasing of menstruation, is established.

Now what is the reason for this extraordinary process occurring every month in the womb? Many theories have been put forward to account for it. One of the first was the idea that it was the curse which Eve took with her from the Garden of Eden after eating the forbidden fruit. Another old theory was that by means of their periods women got rid of various poisons which were elaborated in their system.

Much more rational is the modern "safety-valve" theory. It is that from puberty a woman is capable of bearing a child, and therefore she builds up in herself sufficient blood to nourish one. If conception does not take place this is got rid of by means of periods, and she starts over again to build up, to be followed again by another period, the process being repeated till she becomes pregnant, when the child is nourished on what would have been cast off in the non-pregnant state.

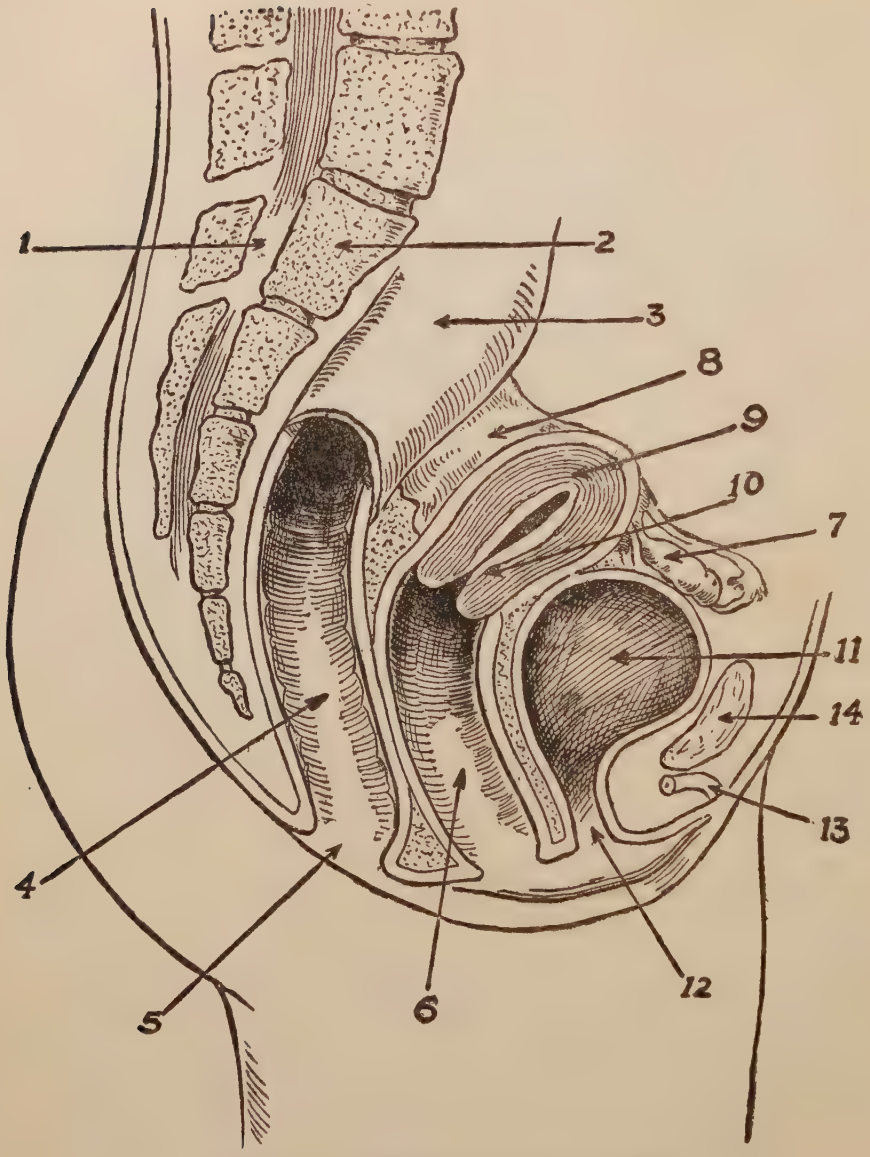
In support of this view it is pointed out that during nursing there are no periods, as the excess is used for the nourishment of the child by the breasts. In cases of bloodlessness, too, there is frequently no menstruation, as the woman requires all her blood for her own needs.

Another theory is that the whole process is intended to make the cavity of the womb suitable for the reception of the child at its earliest stages. Whether one takes the view that by the casting off of some of the lining of the womb a raw surface is left on which the membranes around the child can graft themselves, or the view that the lining membrane is thickened so as to make this process easy, and is only discharged if conception does not take place, really matters very little. That it is for the purpose of preparing the womb is the central idea of both views, and is probably the correct explanation of this mysterious process, which continues all through the time of a woman's fertility, unless she is either pregnant or nursing, when it is suppressed.

The cessation of menstruation, then, in a married woman, is, with the exceptions noted, a sure sign that she has conceived; but even before the cessation has taken place, in some people there are signs of pregnancy which are peculiar to the particular person, such as: increased appetite, a feeling of well-being, a desire for special articles of food, or, on the other hand, headaches, and occasionally faintness. These, however, can be recognized only by women who have experienced them in previous pregnancies.

TIMELY ADVICE TO THE EXPECTANT MOTHER

DON'T overdose yourself with purgative medicines.
DON'T hesitate to drink all the water you can.
DON'T allow yourself to fly into a fit of passion.
DON'T dance, ride, or overexercise.
DON'T allow yourself to gaze at deformed persons.
DON'T lift heavy objects.
DON'T worry; have a cheerful disposition.
DON'T inhale the odor of a freshly painted room.
DON'T overlook keeping your bowels well regulated.
DON'T forget that your sleeping-room should be well ventilated.
DON'T fail to sleep nine hours out of the twenty-four.
DON'T forget your tepid bath once a day.
DON'T lace too tightly; wear loose-fitting garments.
DON'T overindulge in the eating of meats.
DON'T neglect your afternoon nap.
DON'T fail to spend two or three hours out of doors every day.
DON'T overindulge in alcoholic liquors.
DON'T overindulge in sexual intercourse.



URINARY AND GENERATIVE ORGANS OF WOMAN

1. Spinal cord.
2. Spinal column.
3. Colon, or large intestine.
4. Rectum.
5. Anus.
6. Vagina.
7. Ovary.
8. Broad ligament.
9. Womb.
10. Neck of womb.
11. Bladder.
12. Urethra.
13. Blood-vessel.
14. Pubic bone.

PREGNANCY MODEL

Plate 1. External view of the female Pelvic Region.

Plate 2. Arrangement of muscles in the lower abdomen.

1. Rectus muscle
2. External oblique muscle
3. Internal oblique muscle
4. Fascia of the abdominal wall
5. Poupart's ligament
6. The linea alba
7. The navel
8. Inguinal canal
9. Femoral canal
10. Muscles of the thigh
11. Front of the pubes
12. Round ligament.

Plate 3. Uterus and its appendages, after removal of the front of the Abdomen.

1. Rectum
2. Interior of the vagina
3. Upper part of the vagina, into which projects the neck of the womb
4. Body of the uterus
5. Fallopian tube
6. Uterine orifice of the tubes
7. Abdominal opening of the tube with fimbriæ
8. Ovary
9. Ovarian ligament
10. Broad ligament
11. Blood vessels of the pelvis
12. Round ligament.

Plate 4. Uterus and its appendages, showing plexus of veins on right side.

1. Rectum
2. Interior of the vagina
3. Cut edge of vaginal wall
4. External os
5. Body of the uterus
6. Plexus of veins on the uterus
7. Plexus of veins on the ovary
8. Ovary
9. Fallopian tube
10. Abdominal opening of the tube
11. Broad ligament.

Plate 5. Coronal section through the uterus and right ovary.

1. Inner surface of the vagina
2. External os
3. Cervix
4. Body of uterus
5. Fundus of uterus
6. Uterine cavity
7. Fallopian tubes
8. Right ovary, showing Graafian follicles and vessels cut across
9. White capsule of the ovary
10. Veins at the sides of the uterus
11. Broad ligaments.

Plate 6. Section of the uterus, with an Embryo in the third to fourth week of Pregnancy.

1. Embryo
2. Amnion
3. Chorion
4. Decidua serotina
5. Decidua vera
6. Vagina
7. Rectum
8. Anus
9. Broad ligaments
10. Ovaries
11. Fallopian tubes
12. Uterine openings of the tubes.

Plate 7. Section through the Uterus, in the eighth to ninth week of pregnancy.

1. Embryo
2. Amnion
3. Umbilical cord
4. Chorion
5. Chorionic villi
6. Wall of the uterus
7. Ovaries
8. Fallopian tubes.

Plate 8. Embryo at the third to fourth month.

1. Embryo
2. Umbilical cord
3. Placenta.

Plate 9. The end of the eighth month of pregnancy.

The back of the child is to the right, and the head is just engaged in the pelvis.

1. Fœtus
2. Placenta
3. Wall of the uterus
4. Bones of the pelvis
5. Head of the femur
6. Coils of bowel
7. Abdominal wall.

Plate 10. The end of pregnancy in a multipara, with the uterus relaxed.

The back of the child is to the right and posterior (R. O. P.). The head is engaged in the pelvis.

1. Fœtus
2. Umbilical cord
3. Cavity of the uterus
4. Placenta
5. Wall of the uterus
6. Pelvic bones
7. Abdominal wall
8. Coils of bowel

Plate 11. Sagittal section of the uterus, showing a head presentation in the period of dilatation during a contraction.

The back of the child is forward and to the left. The cervical canal becomes opened up from within outwards during a pain; the bag of waters is projecting into the canal.

1. Fœtus
2. Umbilical cord
3. Placenta
4. Bag of waters
5. Cervix
6. Bladder (empty)
7. Pubes
8. Sacrum
9. Coccyx
10. Rectum.

Plate 12. Head presentation in the stage of dilatation during a pause in the contractions.

Plate 13. First position of the head (L. O. A.) after rupture of the bag of waters.

Plate 14. Expulsion of the head during a strong contraction (side view).

Plate 15. Expulsion of the head during a strong contraction (front view).



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Morning Sickness.—The next important symptom of pregnancy is "morning sickness," which comes on, as a rule, after the first period missed. As the name indicates, it usually occurs in the morning, when the woman first gets up. She vomits a small quantity of clear, tasteless fluid, and there may be no feeling of sickness with the vomit—it is merely ejected. Sometimes this occurs in the evening instead of the morning, but should never be more than once in the day. It continues during the second, third, and fourth months of pregnancy and should then cease. But it is well to note that in numerous cases there is a feeling of nausea without any vomiting. Should there be vomiting, accompanied by severe nausea, or should it continue after the fourth month, or should it recur more than once in the day, it is well to consult a doctor.

Changes in the Breasts.—The next symptoms of pregnancy in order of occurrence are the changes in the breasts, which usually appear about the third month. Sometimes slight neuralgic pains shooting through them are first experienced. The breasts then begin to increase in size, become nodular, firmer, and more prominent. The veins are fuller and stand out as blue lines. The nipples also become more prominent and are very sensitive; at the same time they become darker in color and a dark ring encircles them, gradually increasing in area till it affects the skin of the breasts. Against this dark background there is sometimes seen a number of white, raised, pimple-like bodies. If the breast be squeezed or rubbed, a quantity of white, milk-like fluid can be expressed, and often this comes out of itself and stains the clothes. This sign is of no value in a woman who has already had children, as the milk may have persisted from the previous pregnancy; but it is of the utmost value as an indication in a married woman who has not before had children, as there are very few other conditions which give rise to it.

Frequent Urination.—During the first three months, owing to the heavy womb pressing on the bladder, there is a frequent desire to pass urine. This disappears after the fourth month, but occasionally returns in the last ten days before confinement. At the same time, owing to the room in the pelvis being taken up by the enlarging womb, there is a certain amount of pressure on the bowel, so that constipation may be an obstinate symptom. Owing to the increased amount of blood which is now coming to

the pelvic organs, there is apt to be a considerable amount of white discharge. Unless excessive, it can be kept in control by ordinary cleanliness. (These symptoms are referred to at greater length later on.)

"**Quickening.**"—The next important symptom is that of "quickening," which may appear as early as the third month, or as late as the fifth. The nature of the movement, which is due to the movements of the child in the womb being communicated to the abdominal wall on which that organ now rests, seems to vary considerably in different individuals. In many it is represented by a pulsation; in some it has been described as a slight "fluttering"; while in others the movements may be very vigorous. This depends on whether the woman is stout or thin. In many women there is a feeling of movement due to the gas in the bowels, earlier than the date of quickening, which may be mistaken for it by a woman in her first pregnancy. It is hard to say how much is really felt and how much is perhaps magnified by a highly strung, nervous system, for at this time some women are inclined to hysterical outbreaks.

In women who have had children before, it recurs with remarkable regularity and is within a day or two each time of the eighteenth week or mid-term (four and one-half months). In women who are carrying their first baby, on the other hand, the time when the quickening is first noticed is more indefinite, varying in many cases from fourteen to twenty-one days from mid-term. This is probably explained by their want of knowledge from experience. It is usually recognized late in elderly women with their first child, and a typical example of this is mentioned in the Bible, in the case of Elizabeth, the mother of John the Baptist.

The movements become more vigorous as the child increases in size, and may be pleasurable, or so powerful as to give rise to some discomfort to the mother, especially at night, and so prevent her getting her proper rest. They seem to bear a relationship to the taking of food by the mother, which always lessens them in vigor.

Quickening has been associated with great fallacies in bygone days both in connection with the law and the general public. It was generally supposed—and is, to a great extent, to the present day—that quickening was the arrival of the soul or

spirit in the developing child. Before this time the child was not considered as separate from the mother. After quickening, however, it was supposed to be a real living being with an identity of its own. This is still seen in criminal or artificial abortion. Most of these criminal miscarriages are brought on between the third month and mid-term, before quickening has occurred. In England, formerly, if a woman were condemned to death and had quickened with child, a respite was granted till after the birth. This point of view is entirely wrong, as the child is living as truly from the early days of conception as after quickening; so that for anyone to procure miscarriage before "feeling life" is as great a crime and as much murder as after quickening.

Physical Signs.—If the sound of the child's heart be detected during the fifth month, that sign furnishes positive and incontestable evidence of pregnancy. The means by which the heart sound may be heard is of great value to the nurse or friend of the woman who may be suspected of being in a state of gestation. If conception be a reality, the sound of the fetal heart may be heard by resting the ear on the abdomen one inch below the navel. This sign is of peculiar value, as by its means it is possible to determine definitely not only the child's presence and its actual position, but it can also be definitely ascertained, in some cases, whether the sex of the fetus is male or female. This is known by the number of heart-beats of the fetus in one minute. The heart of the male fetus beats between 120 to 130 per minute, and that of the female from 140 to 150 beats per minute. Press the ear against the center of the abdomen to hear the beats. Another sound can also be heard, which is caused by the blood rushing through the enlarged arteries. It must not be forgotten that no sign is absolutely reliable before the fifth month, when the fetal heart-beat can be regarded as the one on which absolute reliance can be placed.

Abdominal Changes.— Among other marks of pregnancy are certain changes in the abdominal wall which make their appearance about the third month, the earliest of which is a dark line which runs upward to the navel in the middle line. Later, with the enlargement of the womb, the abdominal wall becomes so stretched that it cracks below the surface, which gives rise to broad pink lines or "striæ." After the confinement, these

striæ become white and silvery and remain as a permanent mark of the pregnancy. They do not always occur in pregnancy, and as they may be caused by any great distention of the abdomen, their presence does not necessarily mean that the woman has had a baby. On the other hand, their absence does not mean that the woman has not had a child.

During the first three months the navel is rather deepened, but by the sixth month it is flush with the rest of the wall. During the last three months the navel protrudes. In later pregnancies, the effects of the previous one may have so weakened the abdominal wall that the womb protruded excessively; this, however, should never be present in a first pregnancy, and if it is, a doctor should be at once consulted as to what is the cause of the extreme prominence, or, as it is technically called, "pendulous belly."

DURATION OF PREGNANCY

Let us now pass to the consideration of how to calculate the duration of pregnancy and when the baby is likely to arrive. The table arranged on the opposite page will be of special interest to the woman who wishes to be as accurate as possible in determining the approximate date for the delivery of her child.

The first signs of "quickening" are usually experienced at about the center stage of the pregnant condition, or 140 days after the last menstrual period. For instance, the last menstrual period being January 1st, 140 days thereafter would be May 20th, when the quickening should be experienced, and 140 days from May 20th (this being the balance of the days of pregnancy), would bring the approximate date for delivery about October 8th.

Another method is to count back three months from the last menstrual flow and add seven days. For instance, the last menstrual flow being January 1st, you would count back three months, which would be October 1st, and adding seven days, would bring the approximate date of the approaching birth to October 8th.

It must also be remembered, that while the average period of pregnancy is 280 days, in many cases the time is longer or shorter by just a few days; and, as a general rule, first births occur within less time than 280 days.

M	**Jan.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Q	May	20	21	22	23	24	25	26	27	28	29	30	31	Jun 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
D	Oct.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Nov 1	2	3	4	5	6	7
M	**Feb.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
Q	Jun.	20	21	22	23	24	25	26	27	28	29	30	Jul 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
D	Nov.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Dec 1	2	3	4	5			
M	**Mar.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Q	July	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D	Dec.	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan 1	2	3	4	5
M	**Apr.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Q	Aug.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Sep 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
D	Jan.	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Feb 1	2	3	4	
M	**May**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Q	Sep.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Oct 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D	Feb.	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Mch 1	2	3	4	5	6	7
M	**Jun.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Q	Oct.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Nov 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
D	Mch.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Apr 1	2	3	4	5	6	
M	**July**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Q	Nov.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Dec 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D	Apr.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	May 1	2	3	4	5	6	7
M	**Aug.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Q	Dec.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jan 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D	May	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Jun 1	2	3	4	5	6
M	**Sep.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Q	Jan.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Feb 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D	Jun.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Jul 1	2	3	4	5	6	7
M	**Oct.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Q	Feb.	18	19	20	21	22	23	24	25	26	27	28	Mch 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
D	July	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aug 1	2	3	4	5	6	7
M	**Nov.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Q	Mch.	21	22	23	24	25	26	27	28	29	30	31	Apr 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
D	Aug.	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Sep 1	2	3	4	5	6	
M	**Dec.**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Q	Apr.	20	21	22	23	24	25	26	27	28	29	30	May 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
D	Sep.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Oct 1	2	3	4	5	6	7

M=Last Menstrual Period. Q=Quickening. D=Date of Delivery.

The following table will be helpful to those married women who are seeking knowledge as to their procreative possibilities.

TABLE OF BARREN AND CONCEPTIVE PERIODS

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
Jan. 1	Jan. 5	Jan. 6	Jan. 17	Jan. 18	Jan. 28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	31
5	9	10	21	22	Feb. 1
6	10	11	22	23	2
7	11	12	23	24	3
8	12	13	24	25	4
9	13	14	25	26	5
10	14	15	26	27	6
11	15	16	27	28	7
12	16	17	28	29	8
13	17	18	29	30	9
14	18	19	30	31	10
15	19	20	31	Feb. 1	11
16	20	21	Feb. 1	2	12
17	21	22	2	3	13
18	22	23	3	4	14
19	23	24	4	5	15
20	24	25	5	6	16
21	25	26	6	7	17
22	26	27	7	8	18
23	27	28	8	9	19
24	28	29	9	10	20
25	29	30	10	11	21
26	30	31	11	12	22
27	31	Feb. 1	12	13	23
28	Feb. 1	2	13	14	24
29	2	3	14	15	25
30	3	4	15	16	26
31	4	5	16	17	27
Feb. 1	5	6	17	18	28
2	6	7	18	19	Mar. 1
3	7	8	19	20	2
4	8	9	20	21	3
5	9	10	21	22	4
6	10	11	22	23	5
7	11	12	23	24	6
8	12	13	24	25	7
9	13	14	25	26	8
10	14	15	26	27	9
11	15	16	27	28	10
12	16	17	28	Mar. 1	11
13	17	18	Mar. 1	2	12

TABLE OF BARREN AND CONCEPTIVE PERIODS
Continued

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
Feb. 14	Feb. 18	Feb. 19	Mar. 2	Mar. 3	Mar. 13
15	19	20	3	4	14
16	20	21	4	5	15
17	21	22	5	6	16
18	22	23	6	7	17
19	23	24	7	8	18
20	24	25	8	9	19
21	25	26	9	10	20
22	26	27	10	11	21
23	27	28	11	12	22
24	28	Mar. 1	12	13	23
25	Mar. 1	2	13	14	24
26	2	3	14	15	25
27	3	4	15	16	26
28	4	5	16	17	27
Mar. 1	5	6	17	18	28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	31
5	9	10	21	22	Apr. 1
6	10	11	22	23	2
7	11	12	23	24	3
8	12	13	24	25	4
9	13	14	25	26	5
10	14	15	26	27	6
11	15	16	27	28	7
12	16	17	28	29	8
13	17	18	29	30	9
14	18	19	30	31	10
15	19	20	31	Apr. 1	11
16	20	21	Apr. 1	2	12
17	21	22	2	3	13
18	22	23	3	4	14
19	23	24	4	5	15
20	24	25	5	6	16
21	25	26	6	7	17
22	26	27	7	8	18
23	27	28	8	9	19
24	28	29	9	10	20
25	29	30	10	11	21
26	30	31	11	12	22
27	31	Apr. 1	12	13	23
28	Apr. 1	2	13	14	24
29	2	3	14	15	25
30	3	4	15	16	26
31	4	5	16	17	27

TABLE OF BARREN AND CONCEPTIVE PERIODS
Continued

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
Apr. 1	Apr. 5	Apr. 6	Apr. 17	Apr. 18	Apr. 28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	May 1
5	9	10	21	22	2
6	10	11	22	23	3
7	11	12	23	24	4
8	12	13	24	25	5
9	13	14	25	26	6
10	14	15	26	27	7
11	15	16	27	28	8
12	16	17	28	29	9
13	17	18	29	30	10
14	18	19	30	May 1	11
15	19	20	May 1	2	12
16	20	21	2	3	13
17	21	22	3	4	14
18	22	23	4	5	15
19	23	24	5	6	16
20	24	25	6	7	17
21	25	26	7	8	18
22	26	27	8	9	19
23	27	28	9	10	20
24	28	29	10	11	21
25	29	30	11	12	22
26	30	May 1	12	13	23
27	May 1	2	13	14	24
28	2	3	14	15	25
29	3	4	15	16	26
30	4	5	16	17	27
May 1	5	6	17	18	28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	31
5	9	10	21	22	June 1
6	10	11	22	23	2
7	11	12	23	24	3
8	12	13	24	25	4
9	13	14	25	26	5
10	14	15	26	27	6
11	15	16	27	28	7
12	16	17	28	29	8
13	17	18	29	30	9
14	18	19	30	31	10
15	19	20	31	June 1	11
16	20	21	June 1	2	12

TABLE OF BARREN AND CONCEPTIVE PERIODS
Continued

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
May 17	May 21	May 22	June 2	June 3	June 13
18	22	23	3	4	14
19	23	24	4	5	15
20	24	25	5	6	16
21	25	26	6	7	17
22	26	27	7	8	18
23	27	28	8	9	19
24	28	29	9	10	20
25	29	30	10	11	21
26	30	31	11	12	22
27	31	June 1	12	13	23
28	June 1	2	13	14	24
29	2	3	14	15	25
30	3	4	15	16	26
31	4	5	16	17	27
June 1	5	6	17	18	28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	July 1
5	9	10	21	22	2
6	10	11	22	23	3
7	11	12	23	24	4
8	12	13	24	25	5
9	13	14	25	26	6
10	14	15	26	27	7
11	15	16	27	28	8
12	16	17	28	29	9
13	17	18	29	30	10
14	18	19	30	July 1	11
15	19	20	July 1	2	12
16	20	21	2	3	13
17	21	22	3	4	14
18	22	23	4	5	15
19	23	24	5	6	16
20	24	25	6	7	17
21	25	26	7	8	18
22	26	27	8	9	19
23	27	28	9	10	20
24	28	29	10	11	21
25	29	30	11	12	22
26	30	July 1	12	13	23
27	July 1	2	13	14	24
28	2	3	14	15	25
29	3	4	15	16	26
30	4	5	16	17	27
July 1	5	6	17	18	28

TABLE OF BARREN AND CONCEPTIVE PERIODS
Continued

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
July 2	July 6	July 7	July 18	July 19	July 29
3	7	8	19	20	30
4	8	9	20	21	31
5	9	10	21	22	Aug. 1
6	10	11	22	23	2
7	11	12	23	24	3
8	12	13	24	25	4
9	13	14	25	26	5
10	14	15	26	27	6
11	15	16	27	28	7
12	16	17	28	29	8
13	17	18	29	30	9
14	18	19	30	31	10
15	19	20	31	Aug. 1	11
16	20	21	Aug. 1	2	12
17	21	22	2	3	13
18	22	23	3	4	14
19	23	24	4	5	15
20	24	25	5	6	16
21	25	26	6	7	17
22	26	27	7	8	18
23	27	28	8	9	19
24	28	29	9	10	20
25	29	30	10	11	21
26	30	31	11	12	22
27	31	Aug. 1	12	13	23
28	Aug. 1	2	13	14	24
29	2	3	14	15	25
30	3	4	15	16	26
31	4	5	16	17	27
Aug. 1	5	6	17	18	28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	31
5	9	10	21	22	Sept. 1
6	10	11	22	23	2
7	11	12	23	24	3
8	12	13	24	25	4
9	13	14	25	26	5
10	14	15	26	27	6
11	15	16	27	28	7
12	16	17	28	29	8
13	17	18	29	30	9
14	18	19	30	31	10
15	19	20	31	Sept. 1	11
16	20	21	Sept. 1	2	12

TABLE OF BARREN AND CONCEPTIVE PERIODS
Continued

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
Aug. 17	Aug. 21	Aug. 22	Sept. 2	Sept. 3	Sept. 13
18	22	23	3	4	14
19	23	24	4	5	15
20	24	25	5	6	16
21	25	26	6	7	17
22	26	27	7	8	18
23	27	28	8	9	19
24	28	29	9	10	20
25	29	30	10	11	21
26	30	31	11	12	22
27	31	Sept. 1	12	13	23
28	Sept. 1	2	13	14	24
29	2	3	14	15	25
30	3	4	15	16	26
31	4	5	16	17	27
Sept. 1	5	6	17	18	28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	Oct. 1
5	9	10	21	22	2
6	10	11	22	23	3
7	11	12	23	24	4
8	12	13	24	25	5
9	13	14	25	26	6
10	14	15	26	27	7
11	15	16	27	28	8
12	16	17	28	29	9
13	17	18	29	30	10
14	18	19	30	Oct. 1	11
15	19	20	Oct. 1	2	12
16	20	21	2	3	13
17	21	22	3	4	14
18	22	23	4	5	15
19	23	24	5	6	16
20	24	25	6	7	17
21	25	26	7	8	18
22	26	27	8	9	19
23	27	28	9	10	20
24	28	29	10	11	21
25	29	30	11	12	22
26	30	Oct. 1	12	13	23
27	Oct. 1	2	13	14	24
28	2	3	14	15	25
29	3	4	15	16	26
30	4	5	16	17	27
Oct. 1	5	6	17	18	28

TABLE OF BARREN AND CONCEPTIVE PERIODS
Continued

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
Oct. 2	Oct. 6	Oct. 7	Oct. 18	Oct. 19	Oct. 29
3	7	8	19	20	30
4	8	9	20	21	31
5	9	10	21	22	Nov. 1
6	10	11	22	23	2
7	11	12	23	24	3
8	12	13	24	25	4
9	13	14	25	26	5
10	14	15	26	27	6
11	15	16	27	28	7
12	16	17	28	29	8
13	17	18	29	30	9
14	18	19	30	31	10
15	19	20	31	Nov. 1	11
16	20	21	Nov. 1	2	12
17	21	22	2	3	13
18	22	23	3	4	14
19	23	24	4	5	15
20	24	25	5	6	16
21	25	26	6	7	17
22	26	27	7	8	18
23	27	28	8	9	19
24	28	29	9	10	20
25	29	30	10	11	21
26	30	31	11	12	22
27	31	Nov. 1	12	13	23
28	Nov. 1	2	13	14	24
29	2	3	14	15	25
30	3	4	15	16	26
31	4	5	16	17	27
Nov. 1	5	6	17	18	28
2	6	7	18	19	29
3	7	8	19	20	30
4	8	9	20	21	Dec. 1
5	9	10	21	22	2
6	10	11	22	23	3
7	11	12	23	24	4
8	12	13	24	25	5
9	13	14	25	26	6
10	14	15	26	27	7
11	15	16	27	28	8
12	16	17	28	29	9
13	17	18	29	30	10
14	18	19	30	Dec. 1	11
15	19	20	Dec. 1	2	12
16	20	21	2	3	13

TABLE OF BARREN AND CONCEPTIVE PERIODS
Continued

Menses begin	Menses end	Fruitful period begins	Fruitful period ends	Barren period begins	Barren period ends
Nov. 17 ..	Nov. 21 ..	Nov. 22 ..	Dec. 3 ..	Dec. 4 ..	Dec. 14
18 ..	22 ..	23 ..	4 ..	5 ..	15
19 ..	23 ..	24 ..	5 ..	6 ..	16
20 ..	24 ..	25 ..	6 ..	7 ..	17
21 ..	25 ..	26 ..	7 ..	8 ..	18
22 ..	26 ..	27 ..	8 ..	9 ..	19
23 ..	27 ..	28 ..	9 ..	10 ..	20
24 ..	28 ..	29 ..	10 ..	11 ..	21
25 ..	29 ..	30 ..	11 ..	12 ..	22
26 ..	30 ..	Dec. 1 ..	12 ..	13 ..	23
27 ..	Dec. 1 ..	2 ..	13 ..	14 ..	24
28 ..	2 ..	3 ..	14 ..	15 ..	25
29 ..	3 ..	4 ..	15 ..	16 ..	26
30 ..	4 ..	5 ..	16 ..	17 ..	27
Dec. 1 ..	5 ..	6 ..	17 ..	18 ..	28
2 ..	6 ..	7 ..	18 ..	19 ..	29
3 ..	7 ..	8 ..	19 ..	20 ..	30
4 ..	8 ..	9 ..	20 ..	21 ..	31
5 ..	9 ..	10 ..	21 ..	22 ..	Jan. 1
6 ..	10 ..	11 ..	22 ..	23 ..	2
7 ..	11 ..	12 ..	23 ..	24 ..	3
8 ..	12 ..	13 ..	24 ..	25 ..	4
9 ..	13 ..	14 ..	25 ..	26 ..	5
10 ..	14 ..	15 ..	26 ..	27 ..	6
11 ..	15 ..	16 ..	27 ..	28 ..	7
12 ..	16 ..	17 ..	28 ..	29 ..	8
13 ..	17 ..	18 ..	29 ..	30 ..	9
14 ..	18 ..	19 ..	30 ..	31 ..	10
15 ..	19 ..	20 ..	31 ..	Jan. 1 ..	11
16 ..	20 ..	21 ..	Jan. 1 ..	2 ..	12
17 ..	21 ..	22 ..	2 ..	3 ..	13
18 ..	22 ..	23 ..	3 ..	4 ..	14
19 ..	23 ..	24 ..	4 ..	5 ..	15
20 ..	24 ..	25 ..	5 ..	6 ..	16
21 ..	25 ..	26 ..	6 ..	7 ..	17
22 ..	26 ..	27 ..	7 ..	8 ..	18
23 ..	27 ..	28 ..	8 ..	9 ..	19
24 ..	28 ..	29 ..	9 ..	10 ..	20
25 ..	29 ..	30 ..	10 ..	11 ..	21
26 ..	30 ..	31 ..	11 ..	12 ..	22
27 ..	31 ..	Jan. 1 ..	12 ..	13 ..	23
28 ..	Jan. 1 ..	2 ..	13 ..	14 ..	24
29 ..	2 ..	3 ..	14 ..	15 ..	25
30 ..	3 ..	4 ..	15 ..	16 ..	26
31 ..	4 ..	5 ..	16 ..	17 ..	27

DISEASES OF PREGNANCY

Influence of Pregnancy on the Health.—Pregnancy exerts marked influence upon the health of the woman. It is the testimony of medical men of high repute and wide experience that Nature seems to collect and concentrate her forces during pregnancy for the very vital purpose of protecting the health of the woman by keeping off disease. It is not uncommon to observe in a pregnant woman such a change as becoming stout and plump and the disappearance of all signs of poor and delicate health.

Mental Condition.—In order to insure a normal state of pregnancy, the mind should be utterly free from any disturbance whatever. Therefore nothing should be done to excite the nervous system. The pregnant woman should maintain undisturbed calm and composure and cheerfulness coupled with a bright and happy prospect. Great care must be taken to keep the nervous system free from excitement, as a woman during the period of pregnancy becomes more susceptible than usual to the variations to which the nervous system is subject, and she also receives impressions more readily.

Leucorrhea.—At the time of the pregnancy, some women suffer from an excessive white discharge, which is known popularly as "whites." With the majority of people it is only in the last three months that it may become troublesome. It is of no dangerous import and can be kept in check by ordinary cleanliness, but should it become troublesome, the doctor should be told about it, especially if, at the same time, there is any burning pain on passing urine, or very frequent desire to do so.

Treatment.—The best method of treatment is to syringe the passage every morning or evening with water at a comfortable heat for about three minutes. The addition of two or three teaspoonfuls of powdered alum to the pint of water increases the efficacy of the remedy.

Another very good means of alleviating the irritation from the white discharge is the use of a syringe of "bran water." This is made by putting one pound of bran in a cloth with three quarts of water and boiling until half the water is gone. Then

remove the bran and dilute the mixture with an equal quantity of hot water as required.

Salivation.—Salivation, being an excessive secretion of saliva, very often accompanies morning sickness (a symptom heretofore referred to). The secretion is difficult to expectorate. The appetite increases and there are severe attacks of heartburn and a longing for certain foods.

Sometimes, especially in the early months, the expectant mother suffers from headaches, but recourse should not be had to "headache powders" except under the advice of a doctor, as headaches are usually the result of inattention to food or to bowels.

Varicose Veins.—In the latter months of pregnancy, owing to the pressure of the enlarged womb, the veins of the leg sometimes become swollen and distended, which may give rise to no discomfort; but frequently they cause pain, and may set up a kind of eczema in the skin over them which may break down to form an ulcer. This can be avoided by the use of an elastic bandage or stocking, and resting with the feet up, whenever possible.

Nervous Derangements.—The changes produced in the minds and feelings of pregnant women are sometimes of the most extraordinary character. Individuals who possess ordinarily the most agreeable tempers and most amiable dispositions will become peevish and fretful and often even violently passionate and malicious. Others, on the contrary, who are usually ill-tempered and unhappy, attain a charming tenderness of manner and a most pleasing serenity of mind. Their likings and dislikings also change very much, so that their most valued friends will become hateful to them, and those whom they habitually disliked will seem endowed with every lovable quality.

Toothache.—Another troublesome symptom at times is toothache, which may be, and frequently is, due to defective teeth; but, on the other hand, it may be present with the teeth in perfect condition, and no tooth should be pulled during pregnancy without the direct consent of the doctor in charge, as such toothache disappears after the confinement. Besides, the mere pulling of a tooth may give rise in some women to a miscarriage.

Toothache in pregnant women is very often caused by a lack of phosphate of lime in the system. Bones owe their hardness

to lime, and just as soon as the child's bones start to form, they draw the small amount of phosphate of lime from the mother's system, and in this manner the teeth are affected, as they contain a certain percentage of the lime which is in the body.

It is advisable for pregnant women when they are troubled with toothache to use quick-lime. This can be procured at the drug store and prepared in the following manner:

Dissolve a piece of quick-lime, the size of a hickory nut, in seven ounces of water. When the lime is thoroughly settled, pour the water off. Add two or three tablespoonfuls of this water to a glass of milk, and drink three or four glasses of this milk each day, until the toothache ceases.

Constipation.—In ordinary circumstances some women suffer from constipation, and during pregnancy this condition is intensified. Not only is it bad for their general health, but it is a common cause of piles, which are liable to appear in any case some time during the course of pregnancy. Every means should be taken to have a regular movement of the bowels every day, and, if possible, without the use of medicines. A tumblerful of hot or cold water at night and in the morning helps some people, and oatmeal is also an excellent aperient. Other articles of diet useful in this way are the seed fruits, such as figs; and prunes are widely known as being excellent. At the midday meal, too, the woman may with advantage eat green vegetables, which leave an undigested residue, to stimulate the bowels. The best are cabbage, spinach, and Brussels-sprouts. It should be remembered that though milk is so easily digested and therefore excellent in pregnancy, it has a distinctly constipating effect, which is much increased if lime-water is added to it, as is frequently done, as an aid to digestion.

Should medicine be necessary, the mild aperients should be used, and recourse should never be had to such powerful drugs as aloes. Some people find sulphur an excellent drug, either as tablets or as powdered sulphur—one teaspoonful mixed with a tablespoonful of molasses.

Cascara is not a very good drug to use in a single dose. If taken at all, it should be taken in small quantities three times a day. Perhaps best of all is castor-oil. The best way of taking the oil is to squeeze some lemon juice into a glass and shake it thoroughly round, at the same time rubbing the rim of the glass

with the lemon; the oil should be heated until perfectly thin and then poured into the glass and some more lemon squeezed on the top. If swallowed straight and not allowed to come in contact with the teeth, it is hardly tasted at all.

Another method of emptying the bowel is to make use of the enema. The material used should be either plain hot water or with some soap dissolved in it. Sometimes the addition of a tablespoonful of olive oil helps its action. The only disadvantage of the persistent use of such an enema is the overdistention of the bowel, which occasionally becomes chronic. The amount thrown into the bowel in such an enema should be about a pint, and if introduced slowly it should cause no pain or discomfort. At the beginning the patient usually thinks she cannot retain it, but if a moment or two is allowed to elapse and care exercised in the rate at which the enema is given, the full amount can easily be introduced. Another useful injection is a small quantity of glycerine, about a teaspoonful, put into the bowel by a special syringe, or in the form of glycerine suppositories, one being inserted at night.

Piles.—Piles are a most troublesome and distressing accompaniment of pregnancy. They are distended veins at the very lowest part of the bowel, caused by the pressure of the womb on the veins higher up, and are intensified by the constipation. They occasionally become inflamed and the blood in them clots, causing severe pain. Those which are situated inside the bowel —internal piles—are apt to bleed, and though the quantity of blood lost may be small, the result is out of all proportion in the way of depression and feeling of lassitude. External piles, which are situated at the opening of the bowel, do not usually cause so much trouble. Should an internal pile come down after the bowels have moved, it is sometimes caught in the opening and causes a considerable amount of pain and discomfort. It should be returned at once with the finger covered with oil or vaseline, and care should be taken not to injure it in doing so. One of the best methods of treating them, once they have appeared, is to sponge with absolutely cold water every time the bowels move, and a small injection of cold water also helps. They can also be anointed with nut-gall ointment or one of the proprietary ointments such as Pyramid Pile Cure. As a rule, after the confinement they disappear, but may remain as a per-

manent cause of discomfort, in which case a doctor should be consulted with a view to their removal. Such an operation is quite unnecessary during the course of pregnancy.

Heartburn.—In the last few months of pregnancy, perhaps the commonest discomfort to be feared is "heartburn," a burning sensation in the stomach, sometimes accompanied by the rising in the throat and mouth of an acrid fluid. The most effective and harmless way to relieve this is to sip half a tumblerful of water in which half a teaspoonful of powdered bicarbonate of soda has been dissolved.

DOCTOR AND NURSE

Doctor.—The first thing a woman should do when she knows she is pregnant, is to arrange for a doctor to attend her confinement. She must above all other considerations have complete confidence in her medical attendant. She should consult him as to the probable date of her confinement, and find out what his fee for attending her is likely to be. It is a matter upon which there should be no false modesty, as his fee may be beyond her means, and she had better know at once, so that she may make arrangements with another doctor who charges less. Once this arrangement is made, she should ask him, if it be her first baby, to recommend to her one or two of the nurses who are accustomed to work with him. In this way she is sure to get a nurse in whom the doctor has confidence both as regards ability to nurse and her tact in dealing with the patient. She understands what the doctor will want, and prepares accordingly. If a woman has had a nurse at her previous confinement whom she likes, she need have no hesitation in telling the doctor so, and arranging with her to nurse her again. If not, she should have a personal interview with the nurses recommended by the doctor, and take the one she thinks she likes best. She should then arrange with her as to what her fee is to be, and as to when she is to come to the house. Usually a monthly nurse keeps a week clear between each of her cases, so that even if the confinement is a little before its time, she is free to attend it. Some women prefer to have the nurse staying in their house with them for a day or two before the confinement is due, but others prefer to send for the nurse only when the labor has started. As good nurses are booked

months in advance, it is wise that such arrangements should be made as soon as possible. Formerly all monthly nurses required to be old, and the larger their own family, the better nurses they were supposed to be. Nowadays the chief consideration is that the nurse should be fully trained and physically well fitted for her arduous duties.

HYGIENE OF PREGNANCY

Exercise.—There is a very common idea that when a woman is pregnant she should spend most of her time resting, so as to avoid the chance of miscarriage. Perhaps the person most liable to suffer from this delusion is the elderly (in the child-bearing sense) woman of about forty, who has become pregnant for the first time, and knows that her chance of having another child is small.

It is just as bad to a pregnant woman's health for her to take too much rest as it is to take too much exercise, an error into which she rarely falls. The proper amount of exercise cannot be laid down in absolutely rigid hours, as it must vary with the ordinary habits of the woman and her actual physical strength. For instance, a girl who has been accustomed from her school-days to regular daily exercise, such as tennis, hockey, and golf, demands far more exercise as part of her daily life than the girl who has never indulged in any of those strenuous games.

A working-woman has in all probability quite enough to do in her home life to give her all the exercise that she needs, but in her case there is another factor of almost as great importance, and that is, that through working indoors all day she does not get enough fresh air, which is absolutely essential for her health. In her case, night-time is probably the only time that she can get out, and though not the best part of the day, she had better make use of it, for a half-hour's walk, than not go out at all. The girl who has never taken any exercise must learn to do so, and it would be wise for her to start with short walks, say of half an hour at a time during the morning, and again in the afternoon. It will help to tone up all her muscles and help her stand the strain of her confinement, and, still more important, it will help to prevent the constipation which is always associated with pregnancy to a greater or less degree. The athletic

girl knows what she can do, and usually tries to live up to it; she may take her usual amount of exercise for possibly the first month, but she will then find that she is much more easily tired, and her common sense will tell her that she must be more cautious, and not overtire herself.

There are certain forms of exercise—the more violent—which must be given up altogether. To this category belong riding, bicycling, hockey, golf, tennis, and even dancing. In a working-woman's life, the most likely thing to produce trouble, either in the way of miscarriage or displacement, is the lifting of heavy weights, or stretching up for things beyond her reach. As the pregnancy goes on, and the womb increases in size, walking becomes more difficult, but is still the best and safest way of getting the requisite exercise. As we have already stated, no definite rule can be laid down for everybody, and each person must use her common sense, and not overindulge in any way.

During the last two or three months of pregnancy walking may be very difficult, owing to the size and weight of the womb. The greatest comfort will be derived at this time from wearing a broad flannel binder or a belt to support the abdominal wall and more or less lift it up. This may sometimes make all the difference between being able to take exercise in comfort and not taking any at all.

Rest.—On the other hand, there is the question of rest. At least eight hours in bed should be regarded as an absolute minimum, and an extra hour will do no harm. At latest eleven o'clock should be fixed as the hour for going to bed. During her pregnancy it is a wise plan, if possible, for a woman to take an hour or an hour and a half in bed, or on a couch, shortly after the midday meal. At the times which would correspond to the periods, were they present, a woman must be particularly careful, as she is more liable to miscarry then than at any other time, especially at the third month. The reason is that during the third and fifth months there is a development going on, of the afterbirth or placenta, by which the growing child is nourished, and for that reason the woman is more liable to a separation of it and a resulting miscarriage. After this time the same amount of care is not so necessary. In some people, where there is a tendency to varicose veins, these have to be carefully considered in the question of exercise and rest. Such a person must not

only rest more than the average individual, but she should also, when resting, have her feet higher than the rest of her body, so as to favor the return of the blood from the leg. She can also help by having the foot of her bed raised on blocks, four or five inches.

After the seventh month there may be difficulty in breathing comfortably when lying down, owing to the size of the womb, but this can be remedied by propping up the shoulders with pillows.

Dress.—During pregnancy, the main points to be attended to are warmth and comfort, which means that the clothing should be loose and not too light. The corsets, if worn at all, must be loosened, so as to exert no pressure on the enlarging womb. It is possible that tight-lacing at this time has produced that difficult kind of confinement, cross-birth. Accommodation must also be provided for the growth of the breasts. Toward the end of pregnancy the breasts have sometimes grown so big and become so heavy that they may cause the woman a considerable amount of discomfort. In such a case they should be supported by pads of absorbent cotton, under a loose corset or a broad bandage. Warm, loose underclothing should be worn, and roomy combinations in which there is a certain percentage, at least, of flannel or wool.

Sexual Intercourse.—In regard to the question of sexual relationship: it is wiser after the fourth month for the husband to occupy a separate room, and during the early months he should certainly do so, at the times corresponding to when the periods would have occurred.

Appetite.—During the whole course of the pregnancy many women find that their appetite has greatly increased. This may be partly due to the idea that they are nourishing a second individual (and is therefore slightly exaggerated), but it may be actually due to the demands of the child for nourishment. Though this is only natural, the mother must be careful not to overindulge, as her stomach is not at its best, as is evidenced by the sickness during the early months. Naturally, this is the time when most care should be taken as to what is eaten and drunk. In controlling the morning sickness, it is a wise plan to drink a tumblerful of hot water the first thing in the morning before getting up. If retained, it may act as an aperient; if rejected,

it serves to wash out the stomach; and if the woman remains in bed for about an hour afterwards and rests on her right side, she can usually rise and eat quite a good breakfast. The hot water may be flavored with lemon, if preferred.

Diet.—Breakfast should consist of either weak tea or coffee, with some fish or eggs; for those who can take it, oatmeal and milk or cream is one of the best breakfast dishes possible, as it acts as an irritant to the bowel. Many people prefer it at night, and it is even better taken then than in the morning.

The midday meal should be the principal meal of the day, and anything may be eaten at it which is known by experience to agree. The white meats are preferable to others.

For supper, which should not be later than eight o'clock, some light food, such as fish, chicken, sweetbreads, or tripe, should be taken. It is a good time, too, to eat fruit, either fresh or stewed. Either at midday or at night, some kind of fruit is almost an essential. Many people find that they sleep better after taking a tumbler of milk, either hot or cold, and a biscuit or cracker before going to bed. This will frequently be found to be a good thing to prevent the disturbance of sleep due to the excessive movement of the child during the night.

Sleeping-room.—During the course of her pregnancy, if a woman has any choice, she should occupy the largest and airiest bedroom in the house. It should always have a fireplace, and she should, if possible, sleep with the window wide open, to admit of free ventilation. The room should not be too near a lavatory. The spring mattress is so universal that it is hardly necessary to condemn the foolishness of the old feather bed. Blankets and quilt should be as light as is consistent with warmth.

Care of Breasts.—During the last months of the pregnancy, a woman who is having her first baby can avoid a good deal of trouble during nursing by a little attention to the breasts. The nipples, if not previously prepared, are apt to crack and give rise to considerable pain and even "gathering of the breasts." The best thing to do is to bathe the nipples daily with eau de Cologne or dilute alcohol so as to harden them. In this way the suction of the child's mouth is less likely to cause abrasions.

Cleanliness.—More than ever, during pregnancy, should a woman attend to her personal cleanliness. The skin gets rid of

a number of waste products from the system by means of perspiration, and it cannot do this if the sweat-glands are blocked up by dirt. At least twice a week a hot bath must be taken, preferably in the evening, as the person is less likely then to get a chill, and it also helps to induce sleep. A tepid bath should be taken every morning, as it has a bracing effect on the general system. Moreover, it keeps the skin acting, and by cleansing the external genital organs helps to prevent the itching in that region which is sometimes an uncomfortable accompaniment of pregnancy.

COMPLICATIONS OF PREGNANCY

Let us now consider the various dangerous conditions which may arise during the course of pregnancy, and give a few hints as to how these may be noticed and the doctor warned of them. It must be remembered that these conditions are the exception and not the rule, and that they can be readily obviated by medical assistance if the doctor is warned in time.

Fits.—Child-bearing is a natural function, and it is hardly necessary to point out that the overwhelming majority of cases have a normal development with no troublesome complications. By far the most dangerous condition arising out of pregnancy to be found in this country is that in which the expectant mother has fits. Sometimes there are no warning symptoms or signs, but, fortunately, much more frequently there are very definite and grave danger-signals.

Symptoms.—The earliest indication of this condition is swelling, in the morning, of the face and eyelids, so that the patient cannot open her eyes, or she begins to find that her feet and fingers are swollen, that she cannot get her rings off or her gloves on. Occasionally there is bleeding from the nose. At the same time, if the patient takes notice, she will observe that she is passing considerably less urine than usual, and that it is much darker in color, with frequently a reddish deposit on standing. A little later, or even from the beginning, she will suffer from various nervous conditions, such as severe headache, which is commonly in the forehead, accompanied very often by flashes of light before the eyes, or seeing double. Her sight, too, may become dim. Occasionally there is buzzing in the ears and the hearing is affected instead of the sight.

A very valuable danger-signal is persistent and severe vomiting. This should have stopped at the end of the fourth month. One cannot overemphasize the importance of such symptoms as severe headache and vomiting, and any woman who suffers from these at or after the sixth month of her pregnancy should not delay an unnecessary hour in consulting her doctor, at the same time taking with her a bottle containing a sample of her urine. The doctor, by testing it, can tell at once whether there are conditions of danger. The seriousness of this condition can be understood when it is realized that it is a practice for most doctors to request all patients in their first pregnancy to send a sample of their urine regularly after the fifth month. During the last two months it should be examined every two weeks. In subsequent pregnancies there is not such a great likelihood of such symptoms occurring, but they cannot be neglected as a possibility. What makes it all the more important to be on the lookout for them is the fact that under treatment the condition may practically always be cured, if discovered before the fits come on.

Treatment.—Should a patient have the early symptoms and not be within easy reach of the doctor, she can help herself very greatly by confining her food entirely to milk and milk puddings made without eggs. This change should not be made too suddenly, but better by substituting milk for two meals on the first day, and the other two the next. She may have to live entirely on milk and nothing else, and in that case should drink not less than ten tumblerfuls in the day. She should also take a purge, such as three grains of calomel at night, to be followed by a Seidlitz powder in the morning. The Seidlitz may be repeated for the next three mornings, and in any case constipation should be particularly guarded against. The skin should be encouraged to act by means of hot baths and warm bedclothes, with hot-water bottles. Should a fit occur, the first thing to be done is to prevent the person biting her tongue by inserting something between the teeth. A doctor must be sent for at once, and pending his arrival the patient should be put to bed and surrounded by hot-water bottles, which should be placed outside the blanket nearest the patient, as she is frequently unconscious, and may be severely burned by them unless this precaution be taken.

One cannot be too emphatic on this subject. The success of treatment, before fits come on, is so great that it should be insisted on that specimens of the urine should be sent at regular intervals to the doctor for testing, whether it is asked for or not, especially if the patient is being troubled with headaches.

Although it is normal for a pregnant woman to have sickness from the second to the fourth months, it may be a source of considerable danger to her if vomiting become excessive or too prolonged. One source of danger is the well known fact that it may stop at any moment for no apparent reason, and therefore a woman is apt to neglect her condition even when it is at its very worst. Instead of being confined to the mornings, the vomiting may be repeated at intervals during the day, and in such a case is accompanied by a feeling of sickness. As it gets worse, the sight of food and even the smell of it may induce vomiting. Naturally the patient becomes thinner, and owing to the interference with the heart's action she begins to suffer from coldness of her feet and hands. Frequently there is a complete cessation of the vomiting, and during this interval she very often suffers from a desire for some extraordinary article of food. The danger-signal which should be kept in mind in these cases is a rise of temperature in the evening, which is accompanied by an increase in the rate of the pulse. If a patient is not attended to she is in danger of passing on to a state of collapse, with severe nervous symptoms, such as delirium or even unconsciousness.

Miscarriage.—A miscarriage means that the contents of the womb are expelled before the seventh month of the pregnancy. After that period, if labor comes on before full time, it is known as "premature labor," as the child is now able to live if born. A miscarriage may occur with very little discomfort to the mother at the time, but it may be the starting-point of trouble for the rest of her life. Too often it leaves behind it a chronic inflammation of the womb which prevents her becoming pregnant again, and if she does so, is apt to lead to another abortion. The amount of bleeding at the time may be worse than at a full-time labor, and thereby so weaken the mother that she is very susceptible to blood-poisoning, which in her weakened state may easily prove fatal or set up such inflammation in the pelvis as to preclude the possibility of her having more children.

Causes.—A few of the causes from which miscarriage is likely to arise are given as follows: lifting or moving heavy articles; too frequent intercourse; strong purgatives; operating a sewing-machine; tight lacing; dancing; tennis; golf; displacement of the womb; falling downstairs. It is possible to prevent miscarriage from any of these reasons by taking the proper and necessary precautions; but if the fetus in the womb be imperfectly developed, or the mother is afflicted with a constitutional disease, or if there is displacement or abnormal condition of the uterus, miscarriage can hardly be averted.

Symptoms.—The symptoms are pain or bleeding, or both. It is rare for pain to come on without some bleeding, but it frequently happens that there is bleeding without any pain. If taken in the early stages, a miscarriage can generally be prevented, hence the importance of having it treated as soon as there is any suspicion of danger. It usually starts with a feeling of weight in the pelvis and of down-bearing, very similar to what occurs in so many people at the time of the periods. It is worse, however, and gradually increases in severity, the pains coming on at regular intervals and being felt more intensely in the back. The bleeding at first is slight; later it becomes more severe and numerous clots are passed.

Treatment.—The patient should go to bed immediately, avoiding sexual intercourse, abstaining from all stimulating food, eating only such articles as toast, gruel, broths, soda-crackers, and tea. The temperature of the room should not exceed 70° F. Avoid all purgatives, and if there is flooding, apply cold compresses over the abdomen.

A miscarriage cannot possibly occur unless the undeveloped child in the uterus has been loosened from it. It is possible, therefore, to prevent a miscarriage if the fetus be only so slightly loosened that there could be no danger to its life. The continual bleeding, however, indicates that sufficient of the fetus has been detached from the walls of the uterus to cause miscarriage. Always call a physician in such cases, and preserve for his examination and inspection whatever may come away from the patient before his arrival. Never neglect to employ the proper measures in cases of miscarriage, even at the very earliest stage, as complete loss of health and years of almost unendurable suffering may result if the correct aid is not given.

By refraining from sexual intercourse after the fifth month, will remove one of the common causes that contribute to miscarriage; for the danger of its occurring is considerably increased after the fifth month of pregnancy.

Delayed Periods.—Occasionally, married women suffer from what they call "delayed periods." Instead of becoming unwell on the proper date, they are a few days late, and the flow is rather more profuse than usual. This is really a very early miscarriage. It is usually the result of some congestion of the womb due to displacement, and a slight operation may be necessary to cure it.

Bleeding.—There is another condition which has frequently some of the characteristics of a miscarriage, such as bleeding and pain, and is often mistaken for one. It is accompanied, however, by a constant pain in the side, or this may be present without the other symptoms. Such a pain should be reported at once to the doctor. If this is neglected, the complication is such that severer symptoms will soon set in, such as violent pain and sometimes vomiting. The patient feels faint and wishes to lie quiet, with the knees drawn up to avoid the pressure of the bedclothes on the stomach. She may feel feverish. As the condition is very dangerous and can only be treated by an operation, it is imperative that a doctor be called in immediately.

Consumption.—The most important disease which may complicate pregnancy, but in no way rising out of it, is consumption. A consumptive woman should not have children. Even if she should suffer no harm herself from the bearing of a child, she ought to know that she may hand on to her baby a tendency to develop the disease. Should such a woman become pregnant, she usually experiences an improvement in all her symptoms and thinks herself much better. The disease does not seem to make any progress until after the confinement, when the drain on her system may cause it to develop with amazing rapidity. Still more dangerous is it for the mother to nurse the child, as the constant drain of nursing so weakens her that the disease makes rapid strides.

Heart Disease.—One of the more serious conditions complicating pregnancy, but not due to it, is heart disease. Unless the doctor is told about it beforehand by the patient—if she herself knows—or he has attended her previously and has thus found

out there is something wrong with her heart, it is apt to be overlooked until far on in the pregnancy, or even after the labor. It is then an extremely dangerous condition. The commonest heart condition is the result of rheumatic fever, and any person who has suffered from this, especially if she has had two or more attacks, should tell her doctor about it, so that he may examine her and find out whether her heart is affected. Some heart conditions are so bad that a patient suffering from them is not fit to risk the danger of child-bearing, while in another kind of heart disease the danger is done away with altogether by the use of chloroform. A doctor alone can judge of the state of a patient's heart.

Scarlet Fever.—It is a strange fact that a woman in the early stages of her pregnancy seems to be more or less immune to scarlet fever and very rarely contracts it, but after her confinement she is very susceptible to it in a dangerous form. Some doctors hold that the woman really contracts the disease earlier, but that owing to the pregnancy it lies latent in her system until after the child is born, when it makes its appearance. It is more likely that, owing to the strain of her confinement, the loss of blood, and the raw surface inside the womb occasioned by the separation of the afterbirth, the woman is after her confinement especially liable to the disease, and unless disinfection of the house has been absolutely perfect (a matter of great difficulty), she contracts the fever quite freely. It may affect her in the typical way, the inflammation of the tonsils being a very marked feature. Scarlet fever also gives rise, by way of the womb, to one of the most dangerous varieties of "childbed" fever. Therefore, if a case of scarlet fever occurs in a house or district where a woman is pregnant, it is much safer for her to leave the district altogether and go elsewhere for her confinement. She will have to be particularly careful as to her clothes, etc., in the way of having them disinfected. This is absolutely necessary, for the danger to the mother is so very great that no trouble should be considered too much to take in order to avoid this serious complication.

As an extra precaution, no one should be allowed to enter the lying-in room who has come from a home where there is scarlet fever, or in fact any contagious disease, such as smallpox, diphtheria, influenza, etc.

SUPPLIES ESSENTIALLY NECESSARY

When the confinement takes place at home, the following articles should be provided and kept in a convenient place:

Absorbent cotton, two to four pounds.
Good quality muslin for abdominal binders, two yards.
Package sterilized gauze, about twenty-five pounds.
Cotton batting, four bundles.
Old sheets, two or three.
Old towels or diapers, one dozen.
Narrow linen tape or bobbin for tying cord, two yards.
Safety pins, both large and small, one dozen each.

Pads and bandages used in the confinement are made from these supplies and should be sterilized. The proper and most convenient method of doing this is given in the following pages. Other supplies needed for the occasion are as follows:

Fluidextract of ergot, one ounce.
Bichloride of mercury tablets.
One quart alcohol.
One jar white vaseline.
Powdered boric acid, four ounces.
Castor oil, glycerine, brandy, peppermint water.
Pound bar pure Castile soap.
One medicine glass, one medicine dropper, one drinking tube.
One douche pan.
Three white enamel or agate basins.
Two quart size pitchers.
Hot water bottle.
Bath thermometer.
Scissors, sterilized.
Slop jar or covered enamel bucket.
Rubber sheeting, one and one-half yards long by thirty-six inches wide; or
White table-oilcloth, same size, to protect mattress.
One fountain syringe, two quart capacity.
One old blanket.
Talcum powder.
Stiff hand brush for doctor's use.

PREPARING THE DRESSINGS

Sanitary Pads.—Every experienced nurse is too well aware how indispensably necessary are these pads in the case of delivery, for they serve the very important purpose of absorbing the discharges after that event. Their dimensions should be ten inches in length, four inches in width and one inch in thickness, and they may be either of absorbent cotton or in large part of batting, but one side must contain a large layer of absorbent cotton. The sterilized gauze should be cut into pieces of such size as to fold around the cotton and extend two or three inches beyond it at each end. Five dozen of these pads will be the least that is required, and must be pinned front and back to the abdominal binder, which is a mere strip of cotton cloth twelve inches in width and of sufficient length to allow of its being comfortably fastened around the abdomen.

Delivery Pads.—Delivery pads are indeed so essential a requisite in cases of proper confinement, that no well experienced nurse can possibly neglect to provide them. There should be two of these pads, each one yard square and four inches thick, and the chief part of the thickness may consist of batting, but the top layer must have no less than one inch of absorbent cotton. As a good and inexpensive substitute for batting, use cotton waste boiled in washing soda and dried thoroughly in the sun, but as it has a rather loose texture, there must be a thick layer of it. Sometimes, newspapers are used both as a protection for the mattress and as delivery pads; but when used as pads for delivery they must, as a very necessary precaution, be covered with old and sterilized sheets.

Gauze Sponges.—For making gauze sponges, of which two dozen are the sufficient requirement, cut sterilized gauze into lengths of fifteen inches and the width of the gauze. Fold one raw edge down three inches and double the strip by placing the selvages together and put the raw edge of the fold outside. Now this must be folded into thirds both ways, and the sponge should be turned inside out in order that all of the raw edges may be on the inside. Cotton pledgets are also a necessity, and these are wads made of absorbent cotton about the size of a hen's egg, with the ends of the cotton twisted into the roll.

Gauze squares are required chiefly for washing the baby's eyes and should be cut into squares of four inches out of the gauze.

The bobbin which is also needed is made by cutting ordinary cotton bobbin in six lengths, each nine inches.

MODE OF STERILIZING

Sterilizing being so vitally essential in confinement cases, as the health and indeed the very life of the mother and baby depend largely upon its use, its value cannot be overestimated. A brief direction as to the method of doing this cannot fail to be useful, not only to the nurse and mother, but also to the general reader into whose hands this book may fall.

The best mode of sterilizing is in a wash boiler, adding a few drops of carbolic acid to a quarter boilerful of water. Make a hammock of muslin, a little longer than the length of the boiler, the purpose being to allow it to hang down about a third of the depth of the boiler. Then place the articles in this hammock, but be careful that the ends of the hammock are fastened to the handles of the boiler, and this must be done so carefully as not to permit the articles to fall out; or the articles can be placed into a bag made of cheese-cloth, whereby they can also be handled more conveniently.

After the water has begun to boil, allow the articles to steam for fully one hour, then take them out and dry them in the sun by hanging them on the clothes-line, which is considered the best way. When this is not possible, recourse must be had to the oven, but every precaution must be taken to guard against their being burned or scorched. When thoroughly dried, they must be put away in some closed place, which must be absolutely clean.

OUTFIT FOR THE BABY

It is very apt to be the case, especially with a first baby, that the mother wastes a good deal of vital energy in the preparation of an elaborate layette, only to find that many of the garments are outgrown before they are worn. On this account it is much more economical, not only of materials but of the mother's strength, to make only a few very simple garments at first. Later, when the baby is older, a wardrobe as the mother desires may be added.

In preparing for the new-born several principles should be kept in mind. The first is that the garments must be warm without being unduly heavy; another, that they must be loose enough to provide for perfect freedom of the muscles; the third is the desirability of perfect simplicity; and the fourth, cleanliness.

THE BABY'S CLOTHES

The following list includes all the garments that it is necessary for any young infant to have for the first few weeks of life.

Three abdominal bands, 6 to 8 inches wide and 20 inches long, soft flannel strips, unhemmed.
Three shirts, size 2, wool and cotton, or wool and silk, not all wool.
Four flannel skirts, "Gertrude" style.
Three nightgowns or wrappers of outing flannel, buttoned in front.
Eight white slips.
Three knit bands, with shoulder straps, part wool.
At least four dozen diapers.
Cloak.
Cap.
Carriage blanket of crocheted or knitted wool.
Three pairs of socks, if in summer; three pairs of long white merino stockings, if the weather is cold.

NURSERY EQUIPMENT

The essential articles for the baby's nursery are a comfortable bed and the things that will be needed in his toilet, as follows:

An old soft blanket.
Four dozen safety pins of different sizes.
Some old soft towels.
Soft wash cloths.
Hot-water bag, with flannel cover.
Talcum powder.
Castile soap.
Olive oil.
Two ounces of boric acid.

A crib. A clothes basket makes a good bed. A basket or box that may readily be moved about is a great convenience.

PREPARATIONS FOR CONFINEMENT

Room.—If there be a choice of bedrooms in the house, the expectant mother should have the biggest and airiest of them for her confinement. She is going to be confined to it for a matter of ten or fifteen days, and it is important that it should be of sufficient size and well ventilated. If possible, it should look to the south, so as to enjoy all possible sunlight. It should not be overcrowded with furniture, and a carpet is preferable to a polished floor and rugs (although the latter is really a better hygienic condition), because of the quietness which is essential for the convalescence of a mother after the ordeal of her confinement. Good ventilation should be insured by means of a fire, but on no account should gas fires be used if their use can be avoided. Sufficient fresh air can be admitted by the windows without lowering the temperature of the room too much. The room should be near, but not next to the bathroom, for the convenience of the nurse. If there is the slightest suspicion that the drains of the house are not in perfect order, they should be tested at once, as bad drains are a fruitful source of "childbed" fever.

Nurse's Room.—It is best to have the nurse's room next the patient's, when this can be done comfortably, and some means of communication, such as an electric bell, should connect the two. The nurse can have her meals there and keep the baby there during the night, only taking it in to the mother at the proper times for nursing. By this means the mother has proper rest during the night, and the child is invariably properly trained before the nurse leaves. On the other hand, a patient may prefer to have the nurse's bed in the room, and dislike to feel that the baby is away from her. In such a case, it is well to provide a room for the nurse to dress in, keep her clothes, etc.

Bed.—The size of the bed is really a matter for the patient to decide for herself, but it is undoubtedly more convenient for nursing if it be a single bed. However, most women prefer a double bed, as it allows them to move about more, and is therefore rather a comfort. It is best made of brass, and the mattress should be a hard one on top of a spring one. Nothing more awkward than a soft mattress at a confinement can be imagined.

Bed-pan.—As the mother is to be in bed for some time after her labor, it is essential that she should have a comfortable bed-pan. By far the most convenient pattern is the slipper shape, and additional comfort may be obtained by the use of flannel covers, which can be removed and washed when necessary.

Preparing the Bed.—As soon as the confinement has started, the nurse should prepare the bed with a view to cleanliness and dryness. It is best to have two sheets of waterproof material, one of which extends practically the whole length and breadth of the bed, and is placed next the mattress. Between this and the under sheet there should be an old blanket, otherwise the patient is apt to feel the chill through the sheet. On the top of the under sheet place a small piece of waterproof material, three feet broad, and long enough to go right across the bed and be tucked in on the other side. Over this one put another sheet, folded so as to cover the waterproof. This is known as the draw-sheet. Between the draw-sheet and the patient there is frequently placed a sheet of absorbent cotton inclosed in gauze; this is about a yard square and about two inches thick, and is pinned to the draw-sheet so that about six inches of it hang over the right side of the bed. It is of the greatest value in absorbing discharges at the time of the confinement, and being cheap, several should be prepared and used during the course of the labor. The bedclothes should be as light as is consistent with warmth, and toward the end of the labor should be folded over out of the way toward the unoccupied side of the bed. The carpet should be covered to the right of the bed and slightly underneath it by a bath mat or any other protection. A small foot-bath should be kept handy as a receptacle for discharges and soiled dressings, etc. After the confinement is over, the absorbent cotton square is burned, and the draw-sheet and upper rubber sheet are easily removed, without disturbing the mother to any great extent. She has thus a comfortable, dry bed to lie on without the fatigue of having it made.

Dress.—When the confinement begins the woman should put on a flannel night-dress, and it is advisable to wear under this an old flannel petticoat which has been recently washed and is not going to be used again. When the labor is at the second stage, the night-dress should be rolled up and pinned in position a little above the level of the waist. In this way the night-dress

may remain unsoiled, and after everything has passed the petticoat can be removed and there is no necessity to change the night-dress.

As the patient is so lightly clad, it is imperative for her bodily warmth that there should be a good fire burning in her room, and it is also useful for having a plentiful supply of hot water. The first thing a good nurse sees to is that there is a sufficiency of boiling hot water and boiled water which has been allowed to cool. This is absolutely necessary, without exception, at every confinement, as a precaution, owing to its enormous value in the treatment of bleeding after the delivery of the afterbirth. Almost anything else can be done without, but one never knows when the necessity for hot water may arise, and it is wanted in a great hurry if needed at all.

As a rule, the nurse will see to the presence of certain antiseptics, but in case of accidents, it is as well for the patient to have some in the house. Probably the most generally useful antiseptic she can purchase is lysol. It is not only powerful and very concentrated, but it is also soapy and acts as an excellent lubricant.

The nurse should see that there is hot water for the doctor to wash his hands, and most doctors like to have a new nail-brush for the purpose.

LABOR

During the last two weeks of pregnancy there are occasional signs that labor is near at hand. During this time the womb sinks down lower in the stomach, especially in a woman with her first baby. The result of this is that the patient experiences much greater ease in breathing, and frequently her digestion improves considerably, and there is not the same tendency to palpitation. The drawbacks, however, are that there is greater difficulty in walking, and any tendency to varicose veins is exaggerated. At the same time constipation is more marked, and there is frequently a considerable amount of trouble with the bladder in the way of frequency of passing urine, or inability to retain it at all. During the last week there is usually a considerable watery white discharge. Just before the labor begins this is frequently tinged with blood, and is known as the "shows"; after its appearance labor usually sets in within twenty-four hours.

The first sign of labor is the occurrence of "pains." These pains are due to the contraction of the womb in the process of expulsion of the child. It is most important to distinguish between these true pains and those known as false pains. The latter are not due to the womb at all, but are usually caused by griping, the result of either dyspepsia or constipation. They can be distinguished from each other fairly easily by a woman who has already had children, but the mistake may easily be made by a woman before her first confinement, with the result that the doctor is sent for when there is no necessity. False pains come on about a month before full time; they are irregular in time and are confined to the abdomen, never affecting the back, and there is usually a history of constipation associated with them. If the hand be placed on the stomach over the womb while one of those pains is going on, the womb remains soft, whereas in a true pain the womb becomes hard and tense. False pains are easily and speedily cured by an aperient or an enema. True pains are regular, and are felt at first in the abdomen, but soon pass round to the back and loins. At first they are short and slight, and there are wide intervals between each pain. They last about half a minute and occur about every quarter of an hour; gradually they increase in severity, become longer in duration, and are separated by shorter intervals.

When labor is fairly well on there is just about five minutes between each pain, and they are now down-bearing in character. The intermittent nature of the pains is most important for the mother, as it allows the child's head to become accommodated to the mother's pelvis, prevents exhaustion of the mother, and allows of a certain amount of softening of the parts, which do not become swollen and torn, as they would if the pains were constant. The pains continue until the womb has emptied itself of the child, and the structure known as the "afterbirth," with its attached membranes.

Not infrequently there is a certain amount of blood-stained discharge with the pains, but this symptom need give rise to no alarm unless the bleeding is really severe, when the doctor should be communicated with at once.

Labor is divided into three stages, and usually lasts, in all, anywhere up to twenty-four hours in a first confinement, and twelve to fifteen in subsequent labors.

First Period.—The first period lasts from eighteen to twenty hours and is the stage of dilatation of the neck of the womb, and its end is usually marked by bursting of the membrane and the discharge of a certain amount of water.

Symptoms.—The woman feels as though she is being drawn together in the inside. There is profuse perspiration, low pulse, great thirst, exhaustion, and trembling. The mouth of the womb expands more and more until it disappears and the cavity of the vagina and womb forms one uniform passage.

Second Period.—The second period is the stage of expulsion of the child and ends with its birth. It lasts from one to three and a half hours. There is then usually a rest, varying from five minutes to quarter of an hour, when the pains return, but with considerably less severity.

Third Period.—The third period is the expulsion of the after-birth, which generally takes from ten to fifteen minutes.

When the "shows" appear, the woman would be well advised to take a full dose of some opening medicine, preferably castor-oil; or the bowels must be emptied by means of an enema. It is essential for the cleanliness of the patient, and if not given, the full bowel is a potent cause in delaying the labor. During this first stage, the woman is better up and moving about than lying in bed. She should not attempt to help herself at this time by "bearing down," as it only exhausts her and serves no useful purpose. She may take any fluid nourishment in the way of milk or soup, but should take nothing solid, as she will probably be getting chloroform later on, and will take it much better on an empty stomach. The doctor should be sent for as soon as labor has properly started, if it be during the day, though there is no necessity in a first confinement to disturb him at once should the labor start in the early hours of the morning. On arrival, he will ask about the pains and will examine the patient to ascertain how far on the labor is and whether everything is normal.

The patient can help the doctor in this examination to a great extent by avoiding straining, and leaving herself as relaxed as possible. It is not, as a rule, at all painful, though rather uncomfortable. Afterward she should ask him how she is progressing, but there is no use inquiring how long the labor will last, as he cannot possibly forecast it with any degree of accuracy at this early stage. After the "waters" have come away and the

second stage has started, the patient goes to bed and remains there. She can now help herself by "bearing down" during the pains, and is assisted in doing this by pulling on a towel tied to the head of the bed. The pain during this stage is at its worst and is felt mainly in the back. It can be relieved to a certain extent by the nurse pressing over the seat of the pain with her hand. When the afterbirth comes away, there is always a certain amount of bleeding, which is rarely excessive in amount, though when it is, it is one of the most dangerous complications of labor.

Nowadays, by means of chloroform in the late stages and the use of a certain drug, "scopolamine," which the doctors may inject under the skin in suitable cases in the early stage, the pains of labor can be mitigated to a great extent, and a confinement is robbed of half its terrors. As a result of the lessening in pain, women now make a much quicker convalescence than formerly, as there is not the same amount of nervous exhaustion.

TWILIGHT SLEEP

Twilight Sleep has not proved as successful as anticipated. This treatment of childbirth consisted of injections of drugs into the arm of the expectant mother. It was thought that these drugs would relieve the woman of her pain, but on account of the variations in the ages of mothers, no definite dose could be set, and the result was that in the majority of cases, the small dose given was ineffective. It also proved to be a failure because it endangered the life of the baby. In many cases the child was born in a coma and could not be revived.

THE BIRTH

In the absence of the physician, the following rules must be strictly carried out:

The Presentation.—An examination should be made with the finger (first greasing the finger with vaseline) to ascertain which part of the infant comes to the mouth of the womb. If it is a normal labor, the child's head will be at the mouth of the womb.

Natural Presentation.—The natural presentation of the infant is the head, when delivery may be expected without much

trouble; however, should there be any difficulty in the body being passed, insert the finger and gently force the shoulder.

Feet or Breech Presentation.—When the feet or breech present themselves first, there is a possibility of the navel-string being pressed against the pelvis by the infant's head, causing death before delivery. In order to avoid this, just as soon as the breech and feet have passed, the delivery must be carefully hastened, and when the shoulders are delivered, the passage of the head may be hastened by gently pulling down the arms.

Position of Cord.—Special care must be taken to observe if the cord is around the neck when the child is born, and if so, it must be either loosened or removed, as a fatal result is likely to occur. It is scarcely necessary here to suggest to the nurse not to fail to observe the usual practice, so very familiar to all competent and well experienced nurses, of putting the finger in the mouth of the baby, in order that anything tending to impede its breathing may be removed. Do not forget to remove the infant's head from the discharges after having laid it on its right side.

The Navel Cord.—Do not cut the navel cord until the infant cries or breathes, as the observance of this rule is of vital importance to the welfare of the babe. As serious consequences have frequently resulted from improperly tying the cord or navel-string, the following directions are given, so that errors may be avoided in so vital a matter:

In tying the cord, great care must be observed that the string used for the purpose be sterilized. First find out and make sure that a loop of the infant's intestines does not pull out into the cord, and with this assurance, proceed to tie the cord in two places. It should first be tied about two inches from the infant's navel, and again, about three and a half inches from the navel. Then cut the cord in the center of the two ligatures, but under no circumstances either tie or cut the cord until it ceases to pulsate, which should be soon after the child breathes. It is advisable to use very strong thread, wrapped tightly several times around the cord and tied in a hard knot. There is, therefore, no reasonable cause for a mistake in this very important matter.

Care of the New-born Babe.—The very greatest care must be exercised to prevent any blood from entering the lungs of the child while efforts are being made to bring about its breathing. In order to induce breathing, cold or warm water may be

sprinkled on the child's chest and face, hanging it frequently head downward, and roll it in a woolen blanket or shawl as soon as it has cried or breathed with some force. Then lay the child on its right side, in a proper and secure place, until the mother has received the necessary attention. Do not cover the child's head, as there is danger of suffocation.

Afterbirth (Placenta).—If, after a reasonable time, the afterbirth is not expelled, a light pressure or a gentle kneading with both hands on the abdomen over the womb will be of great assistance in the passing of the same. When this has been accomplished, a long, broad bandage should be placed around the abdomen to prevent a hemorrhage, and should be worn three or four weeks.

Rest.—The mother should not be allowed to exert herself more than is necessary, and after a short rest a cup of beef tea or broth should be given.

Bathing the Infant.—It is customary to give a thoroughly cleansing bath to all new-born infants directly after birth, if they be strong, healthy, and normally developed. If the infant be covered with a white, cheesy substance, give it a thorough greasing, preferably with pure olive oil or pure vaseline, and after the greasing bathe the baby with soap and water, by laying it upon a blanket or large soft towel across the lap. It is proper that the person who bathes the infant should wear a rubber apron. Have at hand a large basin of warm water with a bar of Castile soap. The infant may be bathed with either a suitable bath-sponge or a soft wash-cloth. Then wrap the baby in the towel and merely rub the outside of the towel to dry the skin. She must be careful to dry thoroughly the creases within the folds of the skin. Now dust the whole body with baby powder, powdered starch, or lycopodium.

As a necessary precaution, it is sometimes advisable to defer bathing the infant if it be weak or its breathing be feeble, and merely grease it, but do not use soap and water until its strength has materially increased.

Care of the Eyes.—Too much care cannot be given to the eyes of the new-born babe, as neglect to give them the proper attention as regards keeping them clean is likely to result in sore eyes. In order to avert this undesirable and troublesome condition, cleanse the eyes by dropping into them sterilized boiled water,

using for this purpose a new medicine-dropper. If the eyes at birth have the appearance of being inflamed, the following eye-wash will be found very efficacious:

℞ Boracic Acid one teaspoonful
Distilled water five ounces
PREPARATION: Add the powder to hot water; let stand, and when cool, pour off clear liquid.

Care of the Navel.—The proper attention that must be given to the navel constitutes one of the important duties and serious responsibilities of the trained nurse. Very great harm can be done to the infant by neglecting to exercise the proper precaution in dealing with its dressings; therefore, the safest and best dressings for the navel are those that are properly sterilized. One of the best kind is borated cotton or sterilized gauze, and it must be handled with clean hands.

The dressing of the cord is no less an important matter and therefore requires equally careful attention. Before dressing the cord, it should be washed thoroughly clean with sterilized or boiled water; afterward dusted with an antiseptic dusting powder, of which the following is of special value:

℞ Salicylic Acid one part
Powdered Starch sixteen parts

Applying the Dressing.—Apply the cloth or gauze by cutting a hole in the center of a piece about four inches square and pass the cord through and lay it upward. Then, with an addition of dusting powder, fold in the edges of the dressing, and after this, apply the bandage. Generally the cord drops off between the fifth and tenth day, but this should not be hastened. Do not lose any time in summoning the doctor if there be any stain on the dressing or any pus about the navel, as it is an indication that infected germs have gained entrance since birth. If prompt attention is not given to this condition, the child is liable to die from blood-poisoning. If the physician cannot be obtained immediately, apply a weak antiseptic dressing.

The Bandage.—The applying of the bandage is of special value because of the importance of its use. Its uses are, first, to keep the dressings on the cord clean and in proper position, and next, to afford adequate support to the abdomen and protection to the intestines. The material of which the bandage should be

made is also a matter worthy of careful attention. It should be made of a strip of flannel eighteen inches long and six inches wide, and should be worn for four or five months, when it can be replaced by a knitted band, to be worn for about twenty months. It must not be drawn too tightly around the abdomen, as it may thereby hamper the breathing of the infant.

Preparing the Breasts.—When the nipple on account of being so depressed is not sufficiently elevated to enable the infant to take it into its mouth, the difficulty may be overcome in the following manner:

Fill an ordinary bottle with hot water; then empty the bottle and apply it just over the depressed nipple, and this will cause the nipple to become elevated soon after the bottle has cooled; then remove the bottle and allow the infant to apply its mouth to the breast, which it will readily grasp. However, if the baby should hesitate to take the breast, excite its desire by the application to the nipple of a small portion of sugar and water or a little sugared milk, which practice is commonly known to all experienced nurses.

Never allow a cracked or sore nipple to touch the infant's mouth, as the contact is likely to result in infection, which has in many instances given rise to abscess of the breast.

CONVALESCENCE

As soon as the afterbirth has come away, that period of convalescence from the confinement begins which is known scientifically as the "puerperium." It is the period of repair from the effects of childbirth, and a return as near as possible to the condition existing before pregnancy. The whole process takes a considerable time, generally about six weeks.

The day after confinement the womb is bigger than it was immediately after the delivery, as by this time there is no danger of bleeding, so that it can relax quite safely. It is then a little above the level of the navel. Steadily, each day, it should decrease in size, until about the twelfth day it should have returned to the pelvis and is not to be felt in the abdomen at all. It is at the very least six weeks before it has returned to its proper size. How this is brought about is not yet known, but there is presumably some change in the muscle wall of the womb

which enables it to be absorbed to a certain extent by the blood stream and so be carried away.

Very commonly, immediately after the confinement is over, the patient begins to shiver and complains of cold and chill. This is of no great significance, as it seems to be reactionary in nature, and if a warm drink is given, an extra blanket put over the patient, and a hot bottle placed in the bed, it passes off in a minute or two.

Immediately after the labor the temperature may be one or two degrees above normal, but in the course of a few hours it sinks to subnormal and then gradually comes back to its normal pitch. For the first few days it may vary between 98° and 100° F., but after the third day it should not be above 99° F. The unstable state of the mother allows very slight disturbances to cause transient rises, however, and mere excitement may cause the temperature to run up in an extraordinary way. It is usual to see a rise, which may be slight or great, on the third day, when the milk makes its appearance in the breast. High temperature from such cause does not affect the convalescence of the mother in any way, but it is an entirely different matter when it keeps up for twenty-four hours at a stretch, or rises regularly day after day in the afternoon or early evening. This is a distinct sign that something is wrong, usually in the way of childbed fever, which we will refer to later.

The pulse is usually faster than normal after the confinement, but should be below 100 unless the patient has had a fairly severe hemorrhage, in which case it may be very fast. It is always well to know the rate of the pulse under normal conditions, as some women have a pulse of 100 always, so that the nurse or the doctor may be quite misled by it unless they are aware of this peculiarity. About six hours after labor it should assume its normal beat for the individual, usually 70 to 80, and should remain so during the rest of the convalescence. It is not subject to the same variations as the temperature, and is a far more reliable guide to the state of the woman's health.

For the first two or three days the mother has not much appetite, as a rule. She is usually thirsty at first, and can be given a drink of hot milk or tea very soon after the confinement is over. The diet for the first two days is mainly fluid, both because of the help to the milk and because the digestion at this

time is not at its best. On the evening of the second day, or even sooner, a dose of opening medicine should be given, preferably castor-oil taken as prescribed elsewhere with lemon or orange juice, which is not quite so acid as the lemon. The dose often was delayed, as it was thought to check the milk supply if given before the latter was established, but it does not seem to have any effect in this way, and is more beneficial given not later than forty-eight hours after the delivery. Thereafter the bowels must be kept acting regularly, if necessary by the use of aperients or enemata.

Usually there is an increase in the amount of urine passed for the first two or three days, but after that it comes back to the ordinary quantity. Troubles with the bladder will be referred to later on in this section.

The discharge from the womb after the delivery, which persists for some three weeks, and is known as the "lochia," is associated with the discharge of the thickened lining of the womb which is present all through pregnancy and does not come away entirely with the afterbirth and membranes. For the first day the lochia consists mainly of blood, usually fluid, but often in small clots as well. It then gets somewhat thinner and darker, but is still mainly blood. By the end of the seventh day all the blood should have disappeared, and the discharge is then yellowish, and gradually diminishes in amount till it disappears at the end of the third week. It has a somewhat heavy and sickly odor, but should never be foul-smelling unless some change is taking place in it which is abnormal. If it is too profuse or is suddenly suppressed it means that there is something wrong, and the cause thereof must be looked for. It is best received on sanitary towels or pads of absorbent cotton, which can be burned immediately after removal, but if the nurse is at all suspicious of anything wrong the last one should be kept until the next is changed, so that the doctor may see the latest for himself when he comes and judge as to the condition of the discharge.

After the discovery of antiseptics there was a great diminution in the amount of fever in our maternity hospitals, where epidemics of it used to rage. To prevent this it was customary for some time to douche all women, whether the temperature was above the normal or not, with some antiseptic, such as corrosive sublimate or carbolic. This has been found to be of no

use in the ordinary normal case, in fact, is even a disadvantage, so now it is never carried out unless there is some indication of the need for it. The way to prevent infection is by cleanliness and the use of antiseptics during the confinement. In douching, a patient may easily become infected with the nozzle, and harm done instead of good, unless proper precautions are taken.

During the first few days the private parts should be frequently swabbed with some antiseptic such as corrosive sublimate, especially after the bowels move or urine is passed. Later corrosive sublimate may be too strong and act as an irritant, so boracic, which is much milder, can be substituted for it.

As a general rule a woman sleeps very well after her confinement, as is only to be expected when one considers the prolonged period of pain she has passed through. If she sleeps badly it is a symptom of considerable importance to let the doctor know about, as it is quite frequently the first sign of various disorders, though sometimes mere excitement may prevent sleep for a few hours. A patient should be kept very quiet for at least a day or two, only her husband or very near relatives being allowed to visit her; but there should not be any darkening of the room in accordance with some old superstition about a strain on the eyes.

The next question to be considered in a normal convalescence is, When is the patient to sit up in bed, and, later, be allowed out of it for a little? This matter has been brought into prominence in the past two or three years by various doctors. Formerly every doctor, without exception, kept his patients in bed for at least ten days, and in many cases three weeks, only allowing them to sit up in bed a day or two before they got up.

The "new school" allow their patients to sit up in bed on the second day, and to leave bed for half an hour or so on the third or fourth. The time they are allowed up is increased by an hour a day till they are up all the time; but a rest of two hours is insisted on every day after the midday meal. This treatment prevents the woman's losing her muscular strength, which an enforced rest of three weeks invariably leads to. Therefore these women are much fitter and make a far quicker recovery than they otherwise would. Secondly, it helps the drainage of the womb, and lets the lochia get away more freely. Again, should any clot be present, it is discharged when

the woman gets up, instead of lying in the womb for a much longer time and so acting as a suitable medium for the growth of germs and predisposing to childbed fever. Also, it helps the circulation greatly, and in this way there is less liability in the woman who gets up early to complications such as "white-leg." It is also said to aid the return of the womb to its normal size.

It is claimed that by the exercise of the abdominal muscles constipation is much less frequent, and finally, it is absolutely denied that it is a factor in producing displacements of the womb either backward or downward, and statistics go to show that certainly there is no larger percentage of displacements in the cases which get up early than in those which are kept in bed for the longer period. The public have always been told that getting up early was the cause of displacements, of a return of bleeding, of the womb not coming back to its proper size, and it has even been blamed, by the public, for the occurrence of "white-leg." In fact, if a woman who got up before the tenth day had anything wrong with her, it was always attributed to the doctor allowing her to get up too soon.

The patients who are allowed up early are warned against two things: they must not attempt to do very much, and particularly must they avoid, for some six weeks or so, the lifting of any heavy weights or the straining up for anything which is beyond reach.

The disadvantage of the system is that it is only applicable in hospitals, and among such people as can afford a monthly nurse. A working-woman is no sooner up than she begins to work, whatever one may say to her—and in this lies the danger. Besides, many look forward to the rest in bed and feel aggrieved at having the reward of their labor denied them.

It is customary for physicians to allow patients to get up on the fifth or sixth day, both in hospital and private practice, and there is certainly no comparison as regards strength and physical well-being between them and those who are kept in bed for the longer period. Women who have experienced both methods are all strongly in favor of the new way, and the difficulty now is to prevent them doing too much. One point which appeals strongly to all women is the fact that they usually regain their former figure more rapidly and perfectly in this way than under the old régime. For the past few years physicians have allowed

patients to get up on the third day, unless there was some definite reason, such as severe hemorrhage or heart disease, etc., which necessitated their staying in bed. It is only reasonable and logical, with the reservations mentioned, to pursue this course. If the mother would rather lie in bed, it would not be advisable to unduly persuade her to get up, but after the facts have been clearly explained to her, she should be allowed to act for herself in this matter.

COMPLICATIONS DURING CONVALESCENCE

There are various complications which occur during convalescence which must be shortly discussed. While none of them are common, they are all very important, and are mentioned here that patients may know and not neglect the symptoms.

CHILDBED FEVER

The chief one is childbed or puerperal fever. Formerly it was a perfect scourge wherever many puerperal women were gathered together, as in hospitals, since it spread from one to another like wild-fire. Now there is nothing like that, but still it is the cause of half the deaths which occur from pregnancy and labor, and this death-rate, taking the country as a whole, has not been reduced during the last thirty years.

It must be remembered that bad surroundings, bad drainage, and general uncleanliness are active factors in its production. In some cases, the germs which may give rise to it are actually present in the genital passages before labor starts. I have seen puerperal fever in more than one case where the child was born before either doctor or nurse arrived and the mother had not been interfered with in any way.

It is caused by the germs which give rise to blood-poisoning elsewhere, with, in addition, as referred to before, scarlet fever, diphtheria, typhoid, pneumonia, and the organism which is always present in the bowel. It is much more common where the woman has had a severe hemorrhage or has a piece of the afterbirth or a clot retained in the womb.

It frequently appears on the third day, but may occur later. It affects the woman very powerfully, often starting with a

shiver, and causes a rise in the temperature and pulse rate. Headache, loss of sleep, and lack of appetite are prominent symptoms. Pain may or may not be present. If seen in time, the doctor can usually combat the disease successfully, especially now with the aid of antiseptics; but it is a fruitful source of invalidism later on, and means a marked delay in the convalescence of the mother.

WHITE-LEG

Another distressing complication of this time is "white-leg," which is due to an inflammation of the veins of the leg, frequently by a spread from the veins of the womb. It comes on, as a rule, late in the convalescent period, but the onset may be at any time from the fifth to the twenty-first day. It makes its appearance with a rise of temperature and pulse, accompanied by a sharp pain in the calf or thigh, and the patient feels generally out of sorts. The leg begins to swell, and as it swells the pain gets less. It becomes tense, white, and glazed, and feels very heavy and dead to the patient. There are often red lines along the course of the affected vein. The left leg is more often affected, but both are subject to it.

This is a troublesome condition, both because it has its dangers and because it has such a slow course. It may last any time up to two months or longer, and even then, though the leg may be back to its proper size while the patient is in bed, it usually swells again when she gets up. Until the doctor comes, the leg should be raised on a pillow and kept quite motionless. The bedclothes should be raised to avoid any pressure, and the limb may be surrounded by hot boracic poultices on which some laudanum has been sprinkled to deaden the pain. Some absorbent cotton bandaged loosely on the top completes all that can be done meantime.

FLOODING AFTER DELIVERY

This is a much more common condition and one of the most serious accidents which can occur in connection with labor, "flooding" after the child is born being not infrequently fatal. Nevertheless it is an accident which can to a very large extent be prevented.

Causes.—The chief cause is inertia of the womb after the child is born, so that, instead of contracting firmly, it remains more or less distended and blood simply pours from it. The conditions which may lead to inertia of the womb at this stage are: exhaustion after a prolonged labor; over-distention of the womb previously, as from twins, etc.; too hurried emptying of the womb with forceps, or in "precipitate" labors, where the whole act is over in a few minutes, as, for instance, sometimes when a woman goes to stool and strains and the child is suddenly born; general weakness or debility, especially from too frequent child-bearing.

A certain amount of hemorrhage occurs, of course, with every labor, but this is not to be confused with serious flooding, in which blood simply pours from the patient and, if not checked, is rapidly fatal. The loss of blood may commence immediately after the birth of the child, or it may not begin for some little time afterward, and it may come on with a sudden gush or gradually.

Prevention.—By simple, proper management of every labor, treating each case, no matter how simple and straightforward it seems, as if it were to be one in which after-flooding were going to occur, this condition can be, in most cases, entirely prevented. From the minute the child is born, and for not less than half an hour afterward, some one's hand should be over the womb, grasping it in the palm through the lax abdominal wall. The womb will be felt every now and again to contract, and at these periods the firmness of the grasp should increase. Between contractions the grasp may be relaxed somewhat, but not sufficiently to allow the womb to relax itself. If the contractions are not felt, occasional firm grasps with the hand will generally succeed in starting them off. The hold on the womb should not be given up until the womb feels hard. As a general rule, this will occur within half an hour of the birth of the child. The hand may be then removed and the firm binder applied. If the womb is felt firmly contracted, it is certain that the afterbirth is out of it, even though it may not have been completely expelled from the body, although it usually is so. Sometimes it remains lying in the vagina, in which case it may quite safely be pulled out by the umbilical cord; but traction on the cord should never be employed until the womb is firmly contracted, as there is the risk not only of hemorrhage, but also of bringing down the top

of the womb, turning it inside out. It is also a good practice to give a dose of ergot of rye (one or two teaspoonfuls of the liquid extract) in all cases after the afterbirth has been expelled, to insure persistent contraction of the womb and to lessen the chance of blood-clots being retained in it.

Treatment.—If flooding actually occurs, it is such a terrifying sight that those in attendance are very apt to lose their heads in the excitement and either do nothing or do the wrong thing. There are various measures which may be employed, all of which have for their object either to set up contractions in the womb or to cause clotting in its vessels. For anyone not actually possessed of a midwifery training, probably the best thing to do is to grasp the womb through the abdominal wall, either with one or with both hands, and endeavor, by firmly grasping and kneading it, to make it contract. If this does not succeed in stopping the hemorrhage soon, then it will be wise to stop bleeding by compression of the abdominal aorta. This vessel, which conveys the blood to all the lower parts of the body, can generally be felt quite easily pulsating just below and to the left of the navel, and by firm pressure with the palm of the hand or with four fingers against the spine, the bleeding can be stopped. This, of course, does not get at the site of the hemorrhage and it is liable to start again when the compression is taken off, but it gains time and may be kept up, if necessary, for an hour or so, until help is obtained. If much blood has been lost, the patient will be very anemic and weak for a long time and will need careful nursing, dieting, rest, and medicines; but it is not necessary to go into the details of that here.

There are occasionally other causes of hemorrhage after delivery, but they are not of sufficient frequency of occurrence nor of such urgency as to demand special description, so that we shall now pass on to the complications which may come on during the puerperium, or period which elapses after the birth until the mother is restored to her ordinary health.

LACERATIONS OF THE PERINEUM

Causes.—Lacerations of the perineum are caused by tears that are made on the wall in front of and behind the vagina during delivery.

Symptoms.—If the front wall of the vagina is torn, there is usually much disturbance in supporting the bladder as well as annoyance in urinating, and the bladder is likely to become inflamed through lack of ability to empty itself completely at each effort. When, however, the wall behind the vagina is lacerated, the tear usually extends through one of the two muscles which constitute the two props of the uterus from below, as it holds up the floor of the pelvis and thus supports the uterus.

Treatment.—The following is the course of treatment that should be pursued: Examine the parts well and fully after delivery, to see if any laceration took place, and if there be any laceration it should be sewed up. Patients should never hesitate or object to submit to having lacerations sewed, as the sewing will obviate much subsequent suffering which is sure to follow an omission of this essential measure; for the lacerations generally heal and the parts are invariably restored to their original condition, if sewed immediately after the birth of the child. If the sewing is not done immediately, the patient will suffer from falling of the womb, falling of the bladder, obstinate constipation, forward and backward displacements of the womb, and the muscles and tissues will not heal at the same time. If there be complete laceration, the control of the bowels will be lost and movements will take place and the patient not be conscious of it. It will be practically of no avail to undertake to sew the lacerations within less than three months after delivery, if this precaution was not taken immediately after the child was born.

When the laceration is incomplete, it extends near or down to, but not through, the bowels as the complete laceration does; but we again repeat, in both kinds of lacerations the sewing must be done immediately after delivery.

GATHERED BREAST

A fairly common occurrence during this period is what is popularly known as a "gathered breast." Much may be done to avoid it by the precautions suggested in the previous pages. It is caused by germs which obtain entrance through cracks in, or down the ducts of, the nipples. It begins by severe pains in the breast, with a rise in temperature and pulse, and frequently head-

ache. In the breast a small, hard, tender lump can be felt. If it goes on to an abscess the skin over it turns red, and eventually the gathering bursts. Before this occurs a large part of the breast has become affected and is destroyed by the abscess. If seen early an abscess can often be avoided, or at least limited in extent. Nursing is stopped, and the milk drawn off by a breast-pump. A purge is given and hot boracic fomentations applied.

BLADDER TROUBLE

There is frequently trouble with the bladder after the confinement. It may be either that the woman cannot pass urine, or it comes away from her involuntarily. In the former case this is frequently due to a nervous cause, from tears or bruises which have occurred during labor. Every means should be employed to get the woman to pass urine for herself, even to letting her sit up, but if all fail it must be drawn off by the doctor.

AFTER CONDITION OF THE WOMB

The last complication we shall refer to is where the womb does not come back to its proper size, but remains permanently large. Of the complications during convalescence it is a common condition, and seems to follow cases where the womb has been over-distended, as in twins. Non-nursing women suffer more frequently from it than those who nurse their children. The presence of inflammation also causes it. Whatever may be the cause, the condition shows itself by the lochia remaining red too long and being rather profuse. The womb is bigger than it should be, and is frequently displaced backward. The later effects are serious, pain, profuse periods, and white discharges being among the least of them. If treated at the time, it is fairly easily cured; but if not, a small operation six months later puts things to rights.

Before leaving the subject of the mother, let us draw attention to the fact that pregnancy and labor are natural conditions; but it must be remembered that though this is so they set up a state in the woman which is on the borderland of disease, and the boundary-line being so easily passed, all possible precautions should be taken to keep the mother well and healthy.

THE CARE OF INFANTS

INTRODUCTION

THE NEWLY BORN CHILD

AFTER birth, the growth and development of every human being are marked by stages or periods, and distinguished by certain well defined features as shown in the following established and universally recognized order, and which will be found highly useful to the general reader.

From infancy to the age of fourteen is the period that embraces what is known as Childhood. At this stage the growth and development of the organs are peculiarly rapid, and they perform their functions more normally than is the case at any other stage. Between the ages of fourteen and twenty the period is known as Puberty, and is marked by the regularity and precision with which all the organs perform their functions. It is during this stage of development that the closest attention must be given to the physical and moral pursuits. At this stage the mind of the child conceives ideas of its own, and it is very essential that the thoughts of the child be of a high standard. In order to establish this path of life, it is necessary to have the body physically fit. It is rather difficult for some mothers to conceive of the close relation between physical development and moral standards.

All human beings are born with certain inherited traits or tendencies, and their actions are influenced by certain external factors. These inherited tendencies are called heredity, and the external factors constitute what is known as environment. These two forces influence the life of the individual for good or evil, and while we may not understand their subtle workings, we cannot from experience and observation deny the fact that they

exert potent influences on our thoughts and conduct. As the period which embraces infancy and childhood is the molding and most impressionable one, the child should always be surrounded by the most wholesome influences in order to insure its moral, mental, and physical well-being. The duty of the mother or nurse charged with the care of the infant is, therefore, sacred and responsible, for the impressions made upon its mind, and the forces that may affect its bodily structure, may exert upon the child influences which will either have a detrimental effect on its mental and moral being, or scatter the elements of physical weakness, which may lead to gradual decline and even premature death. As contact and environment exert a very marked and enduring influence, the health of the child should be carefully guarded by keeping it from contact with persons known to have any infectious or contagious tendencies, or those who are addicted to pernicious practices.

The nutrition of the child is another feature of the mother's sacred duty as being so intimately related to its health and physical well-being. The moral and physical welfare of the child is, indeed, so fundamentally important, that every conceivable precaution should be taken during infancy so that the future well-being of the child be not blasted or endangered by neglect, ignorance, or improper advice. For example, a mother may be advised (as has very often been done) to deprive the infant of its natural sustenance simply because she was led to believe that the milk was disagreeable to its stomach. The untimely loss of this indispensable nutrition frequently has a fatal effect. Again, a mother may be utterly ignorant of the most elementary laws of health, and therefore may either do what a proper knowledge of those laws would prevent her from doing, or she may neglect to do what the nature of the case clearly indicates she ought to do.

She may, through ignorance of rudimentary hygiene, give the infant, or allow some friend to give it, something that may tend to undermine its health; or she may allow a summer complaint to continue without treatment until it is beyond cure. The best interest of the child, therefore, plainly shows that it is the duty of the mother to be fairly well acquainted with whatever will tend to insure the well-being of her child, and thus make certain a normal and healthy development of its body, coupled with the probability of a long life.

SEE THAT THE BIRTH OF YOUR BABY IS REGISTERED

It may sometime be of the utmost importance to your child that there be in existence an accurate legal record of his birth and parentage. It would be well to ask the doctor to make sure that your baby's birth is properly registered, or go to the register's office yourself and see that the record is made. It is suggested that a memorandum be made below of certain facts recorded in the birth certificate.

Baby's name

Father's name

Mother's maiden name

Sex of baby

Date of baby's birth (Month) (Day) (Year)

Birthplace:

City, town, or village

County

State

Attending Physician:

Name

Address

Baby's registered number

DEFORMITIES AND DISEASES OF THE NEW-BORN CHILD

After the child has been bathed, the nurse should examine it with great care, to see if there are any deformities or deficiencies. If this precaution be taken, the child may be saved days of discomfort and sometimes even its life preserved. The penis should be looked at, if the baby is a boy, to see that there is a sufficient aperture for the child to pass water easily. If there is not, the baby strains and cries whenever it passes water, with the result that it is peevish and fretful, and because of the straining is apt to develop a rupture, or hernia. The doctor must be told of it at once, so that the child may be circumcised. We do not know that the Jewish custom of universal circumcision is not one to be adopted. It has many advantages, and we fail to see any disadvantages.

Obstruction of Bowel.—The opening of the bowel must always be examined, as, if there is any obstruction there, it will prove fatal to the child unless speedily attended to. It is not sufficient merely to inspect the buttocks, as the obstruction when it occurs is often situated an inch or so inside the bowel, therefore the nurse should pass either a thermometer or her little finger, well anointed with vaseline, into the bowel to make certain. In the event of there being any obstruction the child naturally can pass nothing, and the condition is noticed after the first twenty-four hours, as the diapers are unsoiled. When the cause is merely a membrane across the orifice of the bowel it is cured by an easy operation, but if the bowel is deficient a short distance inside, the operation is more severe and must be performed at once, owing to the danger to the child's life. In addition to there being no movement of the bowels, vomiting soon sets in, and this is frequently the first thing that draws attention to the child's condition. The condition is rendered worse by the teaspoonful of castor-oil which is given to the baby at the end of the first twenty-four hours. The obstruction prevents its having any effect in the natural way, and it causes the vomiting and griping to be much worse.

If the child's bowels have not moved within thirty-six hours from birth, the doctor must be notified in case the obstruction is too high up to be discovered by the nurse. The higher up it is

the sooner the vomiting sets in, and the more likely it is to be fatal. If the condition be overlooked for any length of time, the child is so exhausted that it dies under the shock of the operation.

The Cord.—The spot where the cord joins the body should be inspected, as there is sometimes a protrusion of the bowel in that region. It is most noticeable after the cord has dropped off, as a small swelling protruding under the skin at the navel, and it is rendered more prominent by the child's crying or straining in any way. It can by gentle pressure be made to disappear as the bowel is returned to the abdomen. The cause is the weakness of the stomach wall at this point, and the space there is between the muscles.

Rupture.—Rupture, or hernia, can usually be cured without operation by means of long-continued pressure, which prevents the bowel from leaving the abdominal cavity. The best way of applying this pressure at first is to wrap a quarter in a piece of boracic lint and cover the opening with it; on the top of this a little absorbent cotton is put, and the binder is applied tightly enough to prevent the bowel protruding at all. Later, if it still persists, a belt with a pad can be obtained, which can be laced up to give enough pressure, and this should never be taken off except when the child is being bathed. These measures are usually successful, and it is only rarely that operation is necessary for this condition.

Rupture of the Groin.—Another place where a rupture is apt to make its appearance is in the groin. There it is not so easily noticed, as the bowel makes its way down a canal in the abdominal wall along with the cord which goes to the testicle, and it does not protrude straight out as in the other variety at the navel. It causes a fullness at one or other side of the penis, and increases in size if the child cries or strains in any way. As in the case of the navel, the bowel can as a rule, by careful and properly directed pressure, be returned to the inside of the abdomen, but it comes down again as soon as the pressure is removed. This variety is much more likely to become what is known scientifically as "strangulated," and cause obstruction of the bowels. It is hardly ever seen in female children, since in them there is no descent of any organ from the abdomen as there is in male children.

It is treated on similar lines to the other, by pressure. This is best managed by a truss which has a pad to so press on the canal through which the rupture comes as to obliterate it. It is difficult to prevent this pressure irritating the tender skin of an infant, especially as the parts become wet from the diaper. For this reason the truss is usually covered with india-rubber to preserve it, and every time the diaper is changed the truss is removed, and the part on which the pad rests is washed and carefully dried. It is then well dusted with powder before reapplying the truss. Washing with a little weak alcohol and water may help to harden the skin and prevent irritation. Owing to the growth of the child the truss has to be altered every six months or so. It is preferable, as a rule, to have the child operated on if the use of the truss does not effect a cure within a reasonable time.

Club Foot.—The child's feet should be examined to see if there is any suspicion of club foot. This condition can be helped a great deal if noticed at birth. In it the foot is usually turned so that the sole looks inward, the inner border of the foot upward, and the heel is very often pulled up as well. The whole foot seems shorter than it should be. To improve it the nurse should so move the foot as to return it to its proper position, and do away with the deformity. This should be done three or four times a day, and at the same time the leg should be rubbed with a little oil, especially the muscles on the inner side and calf. Between times the foot should be kept as nearly as possible in proper position by means of a bandage. Later, splints will be used if necessary, but a great deal can be done by the measures mentioned, if carried out from birth.

Not nearly so common is the type where the sole of the foot looks outward and the outer border upward. It is treated in the same way as the other, but the massage is directed to the outer and front muscles of the leg in this case.

The Head.—There are various head conditions noticeable at birth. Practically every child born in the usual way has a distinct swelling of its scalp. This is due to the part of the head which leads not being supported, with the result that there is an exudation from the blood-vessels of fluid which distends the scalp. It seems a nasty deformity but need give rise to no alarm, as it disappears within forty-eight hours. In very hard labors

the pressure of the mother's pelvis on the child's head may be such as to cause the rupture of a blood-vessel under the covering of one of the bones of the skull, usually the side bones which meet in the middle line at the top. This is a much more serious condition. It can be distinguished from other swellings of the skull by the fact that it is usually on one or other of the bones, and the swelling is limited to it, as the bone covering is attached so firmly at the edges that the blood cannot spread beyond it. Thus the swelling is on one side and does not pass across the middle line on the top of the head, nor does it come down below the level of the top of the ear. It is soft at first, but becomes firmer, and later has a hard edge. It takes about a month or six weeks to disappear, but does so eventually, leaving no deformity behind. Its only danger is, that if there is any scratch over it, it may become infected with germs, and be transformed into an abscess. Nothing can be done to hasten its removal, and it is best left severely alone.

Mother's Marks.—A common condition is the one known as "mother's marks." These are due to a dilatation of the blood-vessels in the skin, hence the reddish or port-wine color of them. They vary greatly in size, and may be so small as to be scarcely noticeable, or may cover half the face or a large area of the body. They are frequently hereditary, and there is no truth whatever in the idea that they are in any way due to anything which may have occurred to the mother while carrying the child. That is a wide-spread belief, and the mark was said to resemble some animal which had frightened the mother during the course of her pregnancy. They usually make their appearance a few days after birth, but sometimes the child is born with them. They may be anywhere on the body, but are generally on the face, and sometimes there are several of them. They are apt to get bigger as the baby gets older, and certainly very rarely show any tendency to disappear of themselves. Operative treatment is most unsatisfactory, as it entails removal of the skin, so that if the mark is of any size it means a scar even more disfiguring than the original mark.

Of recent years, some physicians have been using X-ray, radium, and liquid air in the treatment of these marks, with the result that these treatments have a tendency to stop the growth, allowing new skin to form over the mark.

Still-birth.—If the doctor or a properly qualified nurse is present at the birth, the child is resuscitated and no evil effects follow. Should neither be present, a few hints may be given as to what ought to be done by whoever is there. Still-birth is where the child is born with the heart beating but is making no attempt to breathe. It is usually blue in the face, and the cord is pulsating slowly and strongly. As soon as the head is born the mouth and nose should be wiped out to clear away any mucus. When the baby is entirely born it should be held upside down by the heels and smartly slapped. This both shakes down any mucus from the air-passages into the throat and makes the child cry, which is the best indication that all is well with it.

If this fails, some cold water may be sprinkled on it, or the child may be immersed in a cold bath (for a moment only), and then put into a hot one. This may be repeated several times. Should this fail, some form of artificial respiration is necessary. The simplest method is to hold the child with its buttocks resting on the wrist of the nurse, and its legs hanging down on each side; its back and neck lie on the palm of the hand and fingers. The child is then turned over on to the other hand so as to lie on its stomach and chest, and the chest and back are then squeezed by the first hand. It is then returned to its original position, and the process repeated. This is done about twenty times a minute, so as to establish the proper breathing rhythm.

It is much more dangerous when the child is born very pale and corpse-like, with the cord pulsating quickly and feebly. In that case the child must be placed in a hot bath and a drop or two of whisky allowed to trickle down its throat after the mouth has been wiped out. While in the bath the chest may be squeezed regularly as in artificial respiration, but on no account must any cold water be used, or it may, by shock, prove fatal to the child in its weakened condition.

Inflammation of the Eyes.—Usually about the third day, if this disease is coming on, the eyes become reddened and the lids badly swollen. There is a free yellow discharge, and the lids are apt to stick together. If not attended to, it is a frequent cause of blindness, either partial or total. It can be prevented, as a rule, by merely wiping the eyes, as soon as the head is born, with a piece of clean rag dipped in boracic solution, as it is caused by infection from the mother's passages during birth. If it occurs,

the doctor must be notified at once, owing to the great danger of blindness.

Jaundice.—About ninety per cent. of children suffer from jaundice on the second or third day after birth. Nobody can say for certain what is the cause, and it really matters very little, as it gives rise to no distress in the child unless there is something serious behind it, which is very rarely found to be the case. It does not require any treatment, and disappears of itself in a day or two.

The Skin.—The baby's skin is very active for some time just after birth, and there is frequently a similar activity in the breasts, with the result that they may swell and even have a little fluid in them about the third or fourth day. Should they be irritated then, they may become inflamed and even go on to an abscess. This may be a very wide-spread condition and cause total destruction of the breast and skin around. It may even have graver results. It was predisposed to by the habit old midwives had of forcibly drawing out the nipples of a new-born child to, as they put it, break the nipple strings, an idea which was entirely erroneous, and frequently led to retracted nipples later, the condition it was meant to cure. If they swell up they should be treated by cleanliness and a fomentation, and covered by absorbent cotton applied to preserve them from injury. If they suppurate, the doctor's attention will be required.

Cleft Palate.—In cleft palate the two sides of the roof of the mouth do not grow together properly, with the result that there is a cleft down the middle of more or less of the whole of the soft and hard palate. If allowed to go untreated it causes considerable difficulty in feeding in early life, and later causes a characteristic defect in articulation. The defect should be remedied by an operation, which should be performed within three months after birth. If the cleft is too wide for an operation, its effects can be diminished in later life by wearing an artificial palate.

Harelip.—This is often associated with a cleft palate, but may also occur independently of it. Harelip is a condition in which there are one or more fissures in the upper lip. These may only involve the lip, but may also extend through all the structures of the upper jaw and open into the floor of the nose. The only treatment is by means of an operation, which should be performed

within three months after birth. At times this has to be done within a few days after birth, owing to the impossibility of getting the child to nurse.

Sore Buttocks.—The last condition we will refer to is that of sore buttocks. The cause of this is diarrhea. Sometimes it is due to the mother's milk disagreeing with the child; at other times, and more frequently, artificial food is the cause. The constant moisture of the diapers sets up an irritation of the skin, with the result that the buttocks and insides of the thighs become red and inflamed, and may even become ulcerated. The treatment should be directed to the exciting cause, with the addition of ointments or powders to soothe the skin. If the child is being artificially fed, lime-water should be used to dilute the milk. In this way the diarrhea may be checked. If the child is being breast fed, it may be taken off the breast and fed artificially for a day or two, while the mother has a dose of castor-oil, and her diet slightly altered to simpler foods. The diapers should be frequently changed, and the skin washed and carefully dried; it should then be freely dusted with boracic powder. A favorite application is a mixture of castor-oil and zinc ointment.

Again we would emphasize the fact that with the majority of babies receiving proper care, things do not, for the most part, go wrong, but the duty of mother and nurse is constant watchfulness. Morbid anxiety is to be condemned, but no harm can be done, and much may be prevented, by assiduous distrust of any abnormal symptoms.

NURSING

Unless there is some very definite reason for the mother not to nurse—some condition which nursing would aggravate—every woman should nurse her baby. It is of the greatest value to the child, and it aids the mother's recovery from the strain of her confinement. There is some curious nervous connection between the breasts and the womb, and the irritation of the breasts, set up by nursing, induces contractions of the womb, and thus helps it to return more quickly and thoroughly to its proper size. Mothers who do not nurse are apt to have the womb bigger than it should be for a considerable period after their confine-

ment, with the result that there is a much greater chance of displacement of it either backward or downward.

This alone is sufficient reason for advising every mother to nurse her baby, even if it be for only the first few months. If the breasts are taken care of and emptied regularly by nursing, they should occasion no trouble; they are being used as nature intended they should be used, and nature makes no mistakes.

For the baby, nursing by its mother is of incalculable importance. It is receiving the ideal food for its digestion and nourishment, and no other food—good though some substitutes may be—can approach in character the mother's milk. The child will thrive better, gain more weight, and be better tempered than under any artificial diet. The child gains a great advantage in the early days in some obscure way. The mother's milk at that time seems to supply to the child's blood certain substances which enable it to resist disease in a way that a child artificially fed from the beginning cannot hope to do.

Another enormous advantage to the child is that it is receiving unaltered milk which is absolutely free from any kind of germ that may produce disease, and it is exceedingly difficult to be sure that cow's milk—which is the usual substitute for the mother's—is not contaminated in this way. When one considers that the ordinary milk purchased from a dairy contains roughly 350,000,000 germs to the teaspoonful, the advantage to the child of the mother's nursing can be readily understood. Another advantage to the child is the fact that if a mother nurses her baby she generally takes a much greater interest in it, and therefore is less likely to delegate the entire care of it to an outsider, who cannot possibly have its well-being so much at heart.

Though the milk proper does not come to the breasts till the third day, there is present in them a fluid which is a form of milk and has special actions on the child; it is called "colostrum." It possesses the peculiar property already referred to, and in addition it has a definite purgative action on the child, owing to the large fat-globules which are its striking characteristic. It clears out from the child's bowels the bile-stained material that is in them at birth.

Thus the child should be put to the breast about eight or ten hours after birth, and two or three times a day or even oftener

thereafter till the milk comes and nursing proper begins. This stimulates the breasts to secrete, and it enables the child to get a good grip of the nipples and pull them well out while the breasts, being comparatively empty, are still soft. When the child is nursing it should lie on its right side, with the mother also lying, leaning a little forward and supporting it along her arm. When the mother is out of bed she should always sit quite upright while the baby is having its meal. It should have about five minutes at each breast or ten minutes at one, the other breast being used at the next feed. This may not be quite sufficient for some children, but it is ample for most.

TIME FOR NURSING

The baby should be nursed regularly, by the clock, from the very first, and should have nothing between meals save water to drink. It takes from one and a half hours to three hours for a baby's stomach to empty itself after a full meal of breast milk, and considerably longer for the process of digestion to be completed in the intestines.

The baby should not ordinarily be allowed to remain at the breast over twenty minutes in any case, and the nipple should be withdrawn several times during the nursing, so that he will not take the food too rapidly with consequent regurgitation and indigestion. If the milk is plentiful, the breasts should be nursed alternately, but it may be necessary to give both breasts at one feeding in order to satisfy the baby. Do not let the baby go to sleep while nursing.

HOW OFTEN TO FEED

Most babies thrive better if the interval between feedings is fairly long. This interval may be six hours until the milk is established. From that time the baby may be fed at three-hour intervals until he is six months old, when four hours should be allowed to elapse between feedings. Many babies do well if fed only once in four hours from birth. However, if the breast supply is scanty, more frequent stimulation is sometimes necessary to the success of breast feeding.

Night feeding (after the ten o'clock nursing) may be omitted when the child is four months old.

ADVISABILITY OF NURSING

There is apt to be a time, after the departure of the nurse, when the mother is just getting about her accustomed duties and is somewhat enfeebled and worried with the care of the baby, that the supply of milk decreases. It is at this or some other later period of stress that many babies are needlessly weaned. Instead, the baby should be put to breast with unfailing persistence at regular intervals, no matter how little he gets, since every mouthful of breast milk is important to him. It is the tendency of the breasts to cease to secrete milk when suction is discontinued, and it is essential to a continuance of the supply that it be constantly drawn upon. The mother should be encouraged to eat more nourishing food, such as milk, cream, eggs, meat, and good bread, and to take a larger amount of fluid food. Raw eggs beaten up and added to milk agree well with many persons. Even if the amount of milk diminishes until the baby gets little or none, it may often be reëstablished by patient and constant effort, provided the mother does not worry, but rather strives in every way to build herself up by good food, out-of-door life, and pleasant surroundings, in all of which she should have the help of her family. Meanwhile the baby must be given additional food.

It is also very important for mother and child that nursing should not be continued too long, as the milk begins to get poor in quality, though keeping up in quantity. The child naturally suffers and becomes flabby, soft, and liable to rickets, which is a bone disease, while the mother gets run down and anemic and frequently suffers from severe headaches, palpitation, and indigestion. This is comparatively common among the poorer classes, owing to the impression that they cannot become pregnant again while nursing.

Every now and again with the establishment of the milk in the breasts, especially if it comes on with extreme suddenness and in great quantity, they may become very sore and so react on the mother's system as to cause a certain amount of lassitude and backache. At the same time the temperature may rise a degree or two. This speedily passes off and rarely extends over the first day of nursing proper.

CARE OF THE BREASTS

After each feed, and indeed before as well, the nipple should be washed with some mild antiseptic, of which boracic acid is the best, so as to avoid germs gaining an entrance into any crack which may arise. The nipples are very apt to turn sore and abraded during the first week of nursing, as the child both chews and sucks in getting the milk through the nipple. The cracks are extremely painful to the mother, and are, of course, an open gateway for the entrance of germs to the breasts. They may be either at the extremity of the nipple, and are then more in the nature of an abrasion, or they may be where the nipple joins the breast, and are then usually fissures.

The latter are much the more severe and difficult to cure. They should be carefully attended to or they may be the real cause of an acute inflammation which may end in an abscess, or "gathered breast." Should such cracks occur, the best treatment is to avoid irritating them, by making the child nurse through a nipple-shield. This prevents any reopening of the cracks by the suction of the child's mouth. Between feeds, the nipples should be covered with a boracic fomentation, or, better still, the cracks may be painted with friar's balsam or tannic acid applied as a powder. This is painful for the moment, but soon passes off and the cracks speedily heal. The nipple-shield should be kept clean in the intervals between use by washing thoroughly each time after the feed, and then put in a cup filled with boracic lotion.

Sometimes the mother is compelled to abandon the idea of nursing her baby, owing to some disease or deficiency on her own part, or because of something wrong with the child.

Should the mother become acutely ill with any of the fevers, it is obviously imperative for her to stop nursing at once. Should she be suffering from any wasting disease such as cancer, the double drain on her system hastens the course of the malady. But the commonest contraindication, in the way of disease, to a mother nursing is consumption. It is not that the mother infects the child through the milk, unless she actually has the organism in her breast, but the strain on her system, already weakened by the disease, lowers her vitality to such a degree

that the organism of tuberculosis, already present in her system, finds her an easy prey. Where formerly the disease had been quiescent, it now makes rapid progress, and many mothers have become the victims of galloping consumption as the result of nursing the baby, when, by not nursing, their lives might have been saved or at least prolonged.

Should the mother become pregnant again during the period of nursing, the baby must at once be weaned, owing to the double strain on her strength, the same reason holding good for weaning if the "monthly periods" reappear. During nursing they should not come on, but if they do, they indicate that nursing should be stopped. It used to be thought that their return had a bad effect in the way of souring the milk, but in all probability the only result is a deterioration in its quality owing to the loss of blood from the mother.

In a few cases the mother may have no milk from the very beginning and obviously cannot nurse, while in many cases the nipples may be so indrawn that the child cannot get hold of them. By using a nipple-shield, nursing may be carried on and the suction may draw the nipples out, if the condition is not too extreme. It is a good plan, where the nipples are at all drawn in, for the mother during the last three months of her pregnancy to pull them out gently as far as possible, at least once a day, while the breasts are still soft. If she cannot get hold of them, good results have been produced from suction by means of an ordinary clay pipe. The mother can do this for herself quite easily.

If the mother is unfortunate enough to contract a "gathered breast," the child is, of course, at once weaned.

If the child begins to lose weight, becomes thinner and more fretful, and never seems to leave the breast satisfied, it has to be fed artificially; this is due to the poor condition of the mother's milk, but weaning may prove unnecessary, as much may be done in such cases by improving the mother's diet and perhaps substituting an occasional bottle for the breast feed. However, should the child be born with a harelip or a cleft palate, it cannot exert any suction and consequently cannot feed from the breast and will have to be artificially fed.

If the mother is not going to nurse her baby for one of the various reasons mentioned, steps must be taken to limit the se-

cretion in the breasts as soon as possible. This is usually done by covering the breasts with absorbent cotton and applying firmly a broad bandage so as to exert a good deal of pressure on them. At the same time the diet is limited as far as possible to dry foods, and only the minimum of fluid allowed. After the second day a saline purge such as "salts" or a Seidlitz powder is given every morning, and this still further depletes the body of fluid and helps to dry up the breasts.

These measures are frequently all that is necessary, but often the milk comes in spite of them, in sufficient amount to distend the breasts and make them very painful. It has heretofore been usual in such cases either to exhaust the breasts with a "breast-pump" or massage the milk from the breasts by rubbing them toward the nipples. The latter method can be better carried out by the mother herself than by anyone else. A little oil is put on the breast and it is rubbed firmly but not so hard as to give any pain, the milk being thus gradually expressed, the mother limiting the pressure applied to the amount of discomfort she can endure. If these means are not entirely successful, it is a common practice to apply a belladonna plaster. This should be avoided if possible, as it is most uncomfortable and one cannot see the condition of the breast underneath it; it is also unpleasant to take off. It is best removed by means of ether, although turpentine can be used but is much more painful in its application.

Of recent years some doctors have taken no further means to stop the milk than purging and limiting the quantity of fluid taken. Certainly in a few cases in which this plan was tried, it was a complete success and no inflammation occurred. For perhaps two days the breasts were painful, but after that there was no further discomfort and the milk disappeared very speedily. A warm boracic fomentation is an excellent application if the breasts are hard and knotty. It seems to soothe the mother considerably. The breasts sometimes become so heavy that they have to be supported, and if they become hard and painful the doctor has means at his disposal which can relieve the discomfort. The breast-pump and massage are condemned as merely encouraging the breasts to go on secreting more milk.

While nursing, the mother has to take considerable care of her general health, since upon this depends the quality of the

milk and consequently the nourishment of the child. The quantity of milk secreted depends to a certain degree on the amount of fluid taken. For that reason, the mother should have a diet rich in fluids, and of these, ordinary cow's milk is the most nutritious and most easily digested.

The quality of the milk varies with a number of different factors: diet, exercise, sleep, and mental state.

ARTIFICIAL FEEDING

The most important part of a child's well-being is the administration of an appropriate food in proper quantity at stated intervals. The giving of nourishing food, combined with good care, will keep the child healthy.

Assuming that artificial feeding has to be adopted, the best form of it is cow's milk very carefully modified in each individual case, according to the age of the infant, to resemble as nearly as possible the breast milk of the mother. If the milk does not agree with the baby, it may be necessary to select some other food. Proof that a food agrees with a child is shown by a gain in weight. For this reason mothers should have their babies weighed often, and if a baby loses weight, medical advice should be sought.

The proper method of holding the baby while feeding from the bottle is shown in Illustration No. 1 (following page 256).

CHOICE OF FOOD

In order to use cow's milk, we must make sure that the cows are healthy and the milk kept clean; that is, precautions should be taken against bacteria entering the containers.

Certified Milk.—In certain places it is possible to obtain what is known as "certified" milk, which is fresh, clean, pure, normal milk of uniform composition and highest quality obtained from healthy cows and produced and handled under the supervision of a medical milk commission, with special sanitary precautions. As soon as mothers become convinced of the infinite advantage of having a supply of raw milk whose quality is guaranteed they are quite ready to pay the additional cost. Compared with the cost of the illness due to the use of unclean milk, this is not to be considered. There can be no doubt that the use of certified

milk has been a great factor in the reduction of deaths from infantile diarrhea in recent years.

Modification of Milk is not the mere dilution of cow's milk with water; it embodies the changing of cow's milk to comply with the percentages of fat and sugar present in breast milk.

Physicians, after studying large groups of children, have devised formulas which usually fit a normal child of given age. In feeding babies on cow's milk, it is customary to start them on a formula lower than the one we think they can take. If the child does well, the formula is changed until one is obtained suitable to the particular age of the child.

The important ingredients of milk are fats, proteins, and sugar, and where one child needs a large amount of sugar, the latter has to be added; another child may need excess fat, in which case cream is added to the milk. An important difference between human and cow's milk is that the protein in cow's milk forms a large curd, making a very indigestible mass which does not leave the baby's stomach for many hours. Thus by diluting the milk with water we have smaller curds forming in the stomach, but we also cut down the percentage of fats and sugar, and in order to raise the proportion of fat and sugar we add milk-sugar and cream to the diluted cow's milk.

	APPROXIMATE PERCENTAGES		
	PROTEIN	FAT	SUGAR
Cow's milk	4	4	4
Human milk	2	4	6

The caloric needs of babies have been carefully worked out, and if a child is not gaining weight on a given formula, it is essential to find out the number of calories which it needs and change the formula accordingly. One ounce of fat yields 300 calories, and one ounce of sugar or protein about 130 calories each. Thus from the amount of food and the dilution given, a knowledge is obtained of the caloric value of the food.

AGE	REQUIRED CALORIES	WEIGHT IN POUNDS
First three days	375	7½
3d to 7th day	375	7½
First month	450	9
2d to 3d month	550	12½
4th to 6th month	700	16
7th to 9th month	750	19
10th to 12th month	800	21

A baby requires between forty and fifty calories for each pound of weight. At birth it is fifty, and gradually decreases to the end of the first year, when it is forty. It is important to know the richness of the milk in cream, because if a milk is known to be a rich one, it should not be allowed to stand for creaming as long as an ordinary milk. The importance of cream in milk is shown by the following table:

AVERAGE PERCENTAGE OF FAT IN DIFFERENT PORTIONS OF AVERAGE COW'S MILK (3.5 PER CENT. FAT), AFTER STANDING UNDISTURBED AT 55° F. FOR VARYING LENGTHS OF TIME

	FOUR HOURS PER CENT. FAT	SIX HOURS	OVERNIGHT OR TWELVE HOURS
Upper two thirds	4.42	4.54	4.8
Lower two thirds	1.70	1.51	0.96
Upper half	5.08	5.48	5.88
Lower half	1.90	1.57	1.15
Upper third	6.42	6.92	7.70
Lower two thirds	2.02	1.75	1.37
Upper quarter	7.90	9.03	10.18
Lower three quarters	2	1.68	1.30

If a baby is to be fed on a bottle from birth and not have breast milk, the following table should be consulted and followed, as it is the result of feeding millions of babies.

AGE	MILK OUNCES	BOILED WATER OUNCES	MILK-SUGAR OUNCES	FLOUR OUNCES
1st week	3	7	¼	
2d week	5	10	½	
3d week	6	11	¾	
4th to 6th week	7	12	1	
6th to 8th week	10	13	1	
8th to 12th week	12	14	1	
12th to 16th week	15	15	1	½
16th to 20th week	18	14	½	½
20th to 24th week	21	13	½	½
24th to 28th week	23	12	½	¾
28th to 32d week	25	11	½	¾
32d to 36th week	27	10	½	1
36th to 40th week	29	9	½	1
40th to 44th week	31	8	½	1
44th to 48th week	33	7	½	1
48th to 52d week	35	6	½	1

The following table will give the mother a good idea as to the hours for feeding her baby, the quantity at each feeding, as

well as the number of feedings during the day and the amount of food the baby should have during the twenty-four hours.

AGE	HOURS BETWEEN FEEDINGS	NUMBER OF NIGHT FEEDINGS	NUMBER OF FEEDINGS IN 24 HOURS	AMOUNT FOR EACH FEEDING OUNCES	AMOUNT OF FOOD IN 24 HOURS OUNCES
3 to 7 days	3	1	7	1 to 1½	7 to 10
7 to 21 days	3	1	7	2 to 3	14 to 21
21 to 30 days	3	1	7	3 to 3½	21 to 25
1 to 2 months ..	3	1	7	3½ to 4	25 to 28
2 to 3 months ..	3	1	7	4 to 4½	28 to 32
3 to 4 months ..	3	1	7	4½ to 5	32 to 35
4 to 6 months ..	3		6	5½ to 6	33 to 36
6 to 8 months ..	3		6	6 to 6½	36 to 39
8 to 10 months ..	4		5	7½ to 8½	38 to 43
10 to 12 months ..	4		5	8½ to 9	43 to 45

HOW TO PREPARE THE FEEDINGS

Take the milk-bottle out of the ice-box, rinse with boiled water, and wipe the top with a clean towel. Next remove the paper cap with a fork, which has just been boiled. Then pour out enough milk for the day's feedings, measuring the amount in the graduate glass, and empty it into the pitcher. Measure the required amount of water (using cold boiled water) in the same way and add to the milk. Measure the sugar (milk-sugar) and add this to the milk and water and stir well. Then take as many bottles as there are to be feedings in twenty-four hours, and fill them exactly to the proper depth according to the scale blown in the bottle. If the materials have been carefully measured, the bottles will be filled to equal depth. Close with new, clean bottle corks in preference to wads of cotton, and pasteurize or sterilize the feedings thus prepared in accordance with directions that follow.

Pasteurizing.—This process consists in heating the milk to 145° F., holding it there for some time, and then cooling it rapidly to 50°. The use of one of the excellent pasteurizers and sterilizers in the market greatly simplifies this part of the work, but satisfactory results can be attained by the use of an ordinary pail or kettle. A convenient method for home pasteurizing is as follows:

Put a gallon (four quarts) of water on the stove in a kettle. When the water is boiling hard, remove the kettle from the stove,

to a table and allow it to stand uncovered for ten minutes; then put the filled and loosely corked bottles into the water, cover the kettle, and allow it to stand covered for half an hour. At the end of this time remove the bottles, cool rapidly under running water, and put in the ice-box until needed. Do not uncork the bottle from the time it is first closed until the baby is to be fed.

Boiling.—Fill the bottles and stand them in a kettle of water over the fire. When the water has boiled three quarters of an hour the milk will have been sufficiently heated; or, when more convenient, the milk may be simply boiled in a clean saucepan for three minutes, poured into sterilized bottles, and then cooled rapidly in running water.

CARE OF MILK

Milk quickly turns sour or becomes tainted by dust, dirt, and flies, and may cause diarrhea unless the following precautions are taken:

Buy the milk twice a day and get the best. Do not buy cheap milk; it is dangerous.

Boil the milk at once, for one or two minutes.

Always taste the milk with a spoon before putting it in the bottle, to see that it has not turned sour. Do not keep any milk left in the bottle for the infant's next meal.

The bottle should be scalded out after use and cleaned with a bottle-brush, which should be boiled just before using.

After each feed the nipple should be turned inside out and washed and kept with the bottle, in cold water.

Good milk is often spoiled by dirty bottles.

Flies should not be allowed to get into milk, as they in all probability carry disease germs, especially those causing diarrhea. In some houses there may be a spare window in the nursery which gets no sun and which can hold an outside cupboard or small zinc food-box, made rain-proof but well ventilated; such a device will be found very valuable.

Ice-chest.—If an ice-chest is used, it must be kept sweet and clean, by washing it out regularly every two or three days. It is very quickly done, and unless washed regularly, the chest will smell musty and stale.

Lime-water.—If the child has feeble or disturbed digestion, the addition of lime-water, one ounce at a time to twenty ounces of milk, will be useful. It is not necessary to give lime-water to all children. Previously lime-water was thought to be a stimulant to secretion, but it is only to be given in cases as stated above.

Peptonizing of Milk.—This process of predigesting milk is an aid to the digestion taking place in the child's stomach. It is particularly useful when curds are seen in the stools. Experience has shown that curds found during the first three months contain mostly fat with only a small amount of protein. This is evidence of poor protein digestion, and by improving the protein digestion the curds are found to disappear from the stools. Of the methods for improving protein digestion and eliminating curds, peptonizing is one of the most important. Peptonizing-tubes may be purchased at any drug store and used as follows: the milk is warmed and the powder added and allowed to act for twenty minutes. If the process goes on for more than this time, the milk becomes bitter and distasteful.

Whey.—Protein digestion can be improved greatly by the use of whey in place of whole-milk protein. As already stated, the protein in breast milk forms small curds, while the protein in cow's milk forms large tough curds. By means of rennet, which can be purchased at any drug store, the protein forming these tough curds can be extracted from the milk. The rennet is added to the milk and in a few minutes there is seen a large curd. The best whey is made from skimmed milk, and to be at all pure the whey should be extracted from the milk without pressure. In order to do this, the mixture is allowed to drain through cheesecloth.

The feeding of whey milk is particularly applicable to very young babies, and the change from a simple modification of milk to a whey milk will often immediately cure the severe colic of a young baby; or if a child has been losing weight when fed on pure cow's milk, the change will often cause a gain in weight.

Buttermilk.—For many years buttermilk (which is soured skimmed milk) has been used with success in feeding babies. This buttermilk was used in all probability because it was a refuse product from the manufacture of butter, which could be bought for a small sum and had a good nutritive value.

Children fed upon this were reported to have been benefited by its use. Since the recent popularity of buttermilk associated with the commendation of Metchnikof, it is becoming quite popular in infant feeding. In many children where the stools have an offensive odor, or where there is much gas expelled with the movement, buttermilk may be of great value. It is well to get a brand of buttermilk that is not allowed to become very sour, and this may be mixed at first with sweet milk, beginning with a small addition of buttermilk, and increasing it, as the child becomes accustomed.

Malt Soup.—This food depends for its popularity upon the comparatively large amount of malt sugar it contains. This may be purchased in any drug store as Malt Soup or Neutralized Malt Extract. About the sixth month, it may be advisable to change from milk-sugar and add, in its place, four tablespoonfuls of Neutralized Malt Extract to the baby's daily diet. The object of this food is to feed the baby a large amount of sugar. It has also been found very valuable in children who lose weight, as it seems to stimulate their development. Occasionally, although it is rare, babies fed on Malt Soup will develop diarrhea and become weak; but in most cases the stools become soft and brown, with an odor of malt.

Cane-sugar.—In certain cases babies will be found to feed better on the use of cane-sugar in place of milk-sugar. The form of cane-sugar used is condensed milk; this is added in the same amounts as milk-sugar, as recommended in the charts explained previously. Cane-sugar has, however, a place in the feeding of babies of the poor, because it is materially cheaper and babies do perfectly well on it.

Dry Milk.—In those babies who develop a diarrhea from the feeding of Malt Soup, we have a recourse in dry-milk preparations. Of late years it has been made possible to dry milk; previously, certain parts had to be extracted first. Pure dried milk may now be purchased under the name of mammala. In preparing this dried milk which contains fat, one must mix the dry milk with the required proportion of warm water, just before each feeding. To prepare a four-ounce bottle, two ounces of the dried milk may be measured in a graduate glass, and the water, somewhat too warm for feeding, added to make four ounces. This food is found very good for babies who are diffi-

cult to feed. In changing from dried milk to bottled milk, it is best to substitute milk and gruel and sugar-of-milk gradually, increasing little by little these ingredients, as the dried milk is being stopped.

Drinks of Water for Babies.—Babies from their birth are fond of water and take it quite willingly from a spoon. It should be given when it has cooled sufficiently after being boiled. In a young baby it should be poured, a few drops at a time, into the side of the mouth, as it is lying on the knees. A good deal of the constipation which is troublesome in natural and bottle-fed babies would be avoided if more water was given than is often the case. Water is necessary for a baby, just as well as for adults, and it helps to keep the contents of the bowels more liquid and to ease their passage, especially along the lowest part. It is a good plan to try the effect of one bottle of warm water in the night.

Temperature of the Food.—Each meal should be warmed to the proper temperature as it becomes due. No baby's food should be kept warm over a flame or in a thermos bottle, as it soon changes in flavor and becomes distasteful. The temperature of the food should be about body heat, and although many nurses may be able to estimate this accurately enough by putting the bottle against their cheek, it is much safer to use a thermometer regularly. In summer weather the milk may be given a little cooler than in cold weather, but it must never be given cold. Want of care in giving food at the proper temperature may make a good deal of difference to the baby's digestion and progress.

Measuring the Food.—The component fluid parts of a baby's food should be measured in a suitable glass measure each time, and the amount should not be guessed at. Too much guessing of quantities will spoil the bottles and disturb the baby's digestion. For dry foods or sugar reliable measures should be used. Spoons vary very much in size and capacity, and so if one be used for measuring, it should be kept aside for this purpose. Dry-food measures can be bought at the drug stores. All the utensils required for making the baby's food should be kept separate from others in the house. They should be cleaned immediately after being used, this being a very necessary precaution.

The food for night use must not be kept in the bedroom, as milk will absorb objectionable materials from the atmosphere of a stuffy room. All food should be kept outside the room, covered over, but still have ventilation.

Feeding-bottle.—The essential requirements of a good feeding-bottle are that it can be easily cleaned and that it has no corners or places in which germs, which sooner or later turn the milk bad, can grow. The bottle should be marked in tablespoonfuls, so that the quantity given can be accurately measured. Nipples should not have too many openings, or the milk will run out too fast; the normal number of holes is two or three. If the holes are not large enough, they can be made larger by heating a needle in a flame and pushing it through the holes in the nipple.

Cleaning the Bottles.—After being used the bottles should be at once well washed and with very hot water, a bottle-brush being used. If not convenient to wash the bottle immediately after a meal, it should be rinsed out with cold water or put in a basin of water. When it has been washed it should be placed in a bowl of boiled water, which should cover and fill the bottle itself. The nipple should be treated in the same fashion. On no account should any bottle used for the food be put aside unwashed or unrinsed, because by doing so organisms which sour the milk will develop and the dried milk will be hard to remove. In addition to washing the bottle after each feeding, it must be washed each morning with hot water, with a teaspoonful of bicarbonate of soda added, and the bottle-brush used as well. After this, rinse the utensils in boiled water. When a stiff brush is used, care must be taken to see that no bristles are left in the bottle, as they might be sucked through the nipple and cause trouble.

DANGER OF ARTIFICIAL FEEDING

Not only is it sometimes difficult to find an artificial food mixture that a healthy baby will thrive on, but there is also a danger in artificial feeding of setting up actual disease, which, unless recognized early and corrected by proper measures, may leave permanent marks on the body and health of the child, or be actually fatal. The diseases liable to be set up by artificial feeding are marasmus, rickets, and scurvy.

In marasmus, the child stops developing, the skin turns brown, and the child cries continually. It may be due to disease in the baby, making it unable to assimilate good food, or it may result from improper food being given to a healthy baby. Only the latter condition concerns us here. It most commonly arises in babies which are fed on artificial foods made up with water only, or condensed milk, or those fed on food from the parents' table. The last condition is not likely to be met with except among the poorer and uneducated classes. It may, however, arise from the improper dilution of good, fresh cow's milk for bottle-feeding, and more often by not diluting enough for young babies. Too much cream in the bottle may also lead to malnutrition, and here it may be pointed out again that some cows, especially Jerseys, give too rich a milk for infant feeding.

Scurvy results from the absence of the necessary ferments in the food, which results in bad digestion, absorption, and elimination of food. These ferments are absolutely essential, and they are very sensitive to heat. Pasteurizing fresh cow's milk, that is, bringing the milk to the boil, does not kill the ferment, although it may reduce its activity, for thousands of babies are reared every year on pasteurized milk without scurvy developing. More prolonged boiling and the process of sterilization, by which the milk is kept below the boiling-point for a quarter of an hour or so, are more likely to kill the ferment. There are also little if any fermentative elements in condensed milk or in any of the artificial infants' foods which require the addition of water only before they are ready for use. Even if fresh milk is used with these infants' foods and only brought to the boil, there is still a risk (though not so great as when water is used) of scurvy developing. Scurvy commonly appears about the seventh or eighth month. Most infant foods give instructions as to the regular use of orange or grape juice with them, to prevent the development of scurvy.

Rickets may occur in a baby which has been fed entirely on the breast, and may appear during the breast-nursing period; but it is more common after the first year of life. It is almost certainly a disease which results from deficiency of fat assimilation, whether the defect be due to insufficient fat being absorbed by the digestive system, or an insufficient supply in the food. It is treated by giving proper foods containing more fats, or by re-



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ILLUSTRATION No. 1

PROPER POSITION FOR BOTTLE-FED BABIES



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ILLUSTRATION No. 2

IMPROPER WAY OF CARRYING THE BABY

See page 267



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ILLUSTRATION No. 3

PROPER WAY OF CARRYING THE BABY

See page 267



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ILLUSTRATION No. 4

PROPER WAY OF PLACING BABY IN THE TUB

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ILLUSTRATION No. 5

APPLYING THE BINDER

See page 265



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ILLUSTRATION No. 6

POWDERING THE BABY



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ILLUSTRATION No. 7

APPLYING THE DIAPER

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ILLUSTRATION No. 8

BATHING THE BABY'S EYES

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ILLUSTRATION No. 9

SWABBING THE BABY'S MOUTH

See page 268



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ILLUSTRATION No. 10

PROPER WAY OF TAKING BABY'S TEMPERATURE

See page 279



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ILLUSTRATION No. 11

IMPROPER WAY OF TAKING BABY'S TEMPERATURE

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ILLUSTRATION No. 12

PROTECTING BABY FROM MOTHER'S COLD

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ILLUSTRATION No. 13

EASING THE BABY'S PAINS

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ILLUSTRATION No. 14

PROPER WAY OF GIVING ENEMA

See page 288

moving the causes of any indigestion which is hindering fat assimilation.

The great danger of using any artificial or proprietary infant foods in feeding babies, as has already been stated, is the development of the above-mentioned conditions. They should therefore never be ordered without careful consideration, and only after all reasonable means of modifying fresh cow's milk have been tried; and then under close observation of the baby's health while taking them.

The most dangerous foods are those that require only the addition of water to prepare them for use; the least dangerous, those that require fresh cow's milk to be sterilized. The former may be of use in hot countries where a supply of good cow's milk is unobtainable, but it is only under very exceptional circumstances that they should be used at home. They are also useful on long sea-voyages when it is impossible to get fresh milk. Those foods in which the starch is only partially digested when the milk is added are more suitable for the later months of bottle life, when the baby is more capable of digesting starch. Foods that are rich in ferments and thus aid the digestion of proteins and prevent the formation of large curds are very useful in the early months of infancy. Whenever any of the artificial foods are ordered, their use should be discontinued as soon as possible, and precautionary measures against the development of nutritional diseases properly carried out, such as the giving of orange or grape juice daily.

STARCH FOODS

Many artificial foods for infants contain starch, and they have been divided into four classes, according to their power of digestion.

1. Those foods prepared from desiccated cow's milk with predigested starch added. They require water and no milk to be added, to be ready for the infant.

2. Those foods containing starch which has been partially or wholly digested; some of them contain malt. Milk and water must be added before they are given.

3. Those foods containing starch partially digested, with digestive ferments added which complete the starch digestion and

begin the digestion of the curds of milk. Milk is added as a diluent.

4. Those foods in which the starch is not digested at all. It means that the child must supply the digestive power itself. Whole-wheat flour comes in this class.

UNDERFEEDING

As a rule, babies are overfed rather than underfed. But if the baby cries as soon as the bottle is taken away, and again before the next feeding time, a careful increase may be made day by day toward a stronger mixture, stopping at a point where he is satisfied.

OVERFEEDING

If the baby sleeps restlessly, vomits his food, or has loose bowel movements, it usually indicates that he is being fed too much, too often, or that his food is stronger than he can digest. If the baby is breast fed, the interval between nursings should be lengthened to four hours, as a first measure. It is wise to see the doctor, when possible. For bottle-fed babies the amount of the day's feeding may be decreased by using half of the usual contents of each bottle until the disturbance has subsided.

WEANING FROM THE BREAST

Weaning is the process whereby the baby is gradually deprived of breast milk. It should proceed slowly, one bottle feeding being substituted for one breast feeding during the day for some time, then two bottles, and so on until all breast feeding has been done away with and the baby is entirely weaned. In order that this change may be accomplished with as little disturbance as possible, one bottle feeding may be given to the baby in twenty-four hours as early as the fifth or sixth month. This will hardly be sufficient to upset the baby's digestion and yet will serve to accustom him to the taste of strange food and to the use of the bottle and to begin the education of the stomach in dealing with new materials.

When to Wean.—In most cases the baby should be weaned by the end of the first year, and in some cases from one to three

months earlier, depending largely upon the health of the baby, the amount and quality of the breast milk, and the time of the year. It is unwise to wean the baby in the heat of summer or when infant illness of any sort is epidemic. It has been proved over and over again that breast milk will save a sick baby's life and restore him to health after the strain of a long hot summer, and that often there is no other food that can be relied upon to accomplish the same result. Therefore, even though the breast milk must be supplemented with one or several bottles, it is wise to nurse the baby through the summer so that the breasts will not cease entirely to secrete and may be called on in an emergency. If the baby is weaned at ten months or earlier he may be fed by bottle; if not until the end of the year, he may be taught to drink from a glass or cup directly.

If drinking-water has been given by means of a nursing-bottle during much of the first year, the baby will take his food in the same way the more readily. A healthy infant weaned at nine months should begin with the food for an infant of four or five months. If he digests this mixture well, the strength can be increased until within two or three weeks he is taking the food full strength. Increase in the diet should be made with special caution at the beginning of summer or during the heat, when there is great danger of inducing diarrhea. It is far better to keep the baby on rather a low diet, even without increasing his weight, than to upset the intestinal tract by overfeeding. If, after trying a new food, vomiting occurs or the stools show that there is indigestion, it is always best to return to the weaker food until the disturbance has subsided.

WEANING FROM THE BOTTLE

Between the eighth and twelfth months there may be added, at one of the morning feedings, two ounces of cereal fed with a spoon. This cereal should at first be strained; it is good to use the same cereal that is used in diluting the milk, only making it thicker. In addition, the child should have a small rusk or piece of bread to chew. This is to be given whether the child has its teeth or not. By giving this bread at this time, the child learns to chew, and it is the only food that can be given at this time, because if it is swallowed without chewing it will do no

harm. It is valuable as a stimulant for gastric juice, besides encouraging chewing. Another valuable purpose is to develop the jaws and encourage the eruption of teeth. Bread that is sweetened should not be given, as it starts an unfavorable desire for sweets. If the child should refuse a piece of bread, a substitute such as toast or zwieback may be given.

In the afternoon, in addition to the regular feeding, the baby may be given two ounces of clear soup. This may be mutton broth or chicken broth which has been allowed to cool and has had all the fat removed. Later on, a little vegetable soup may be added, but tomatoes are not to be given. It is necessary to have the vegetables thoroughly cooked—that is, until they are soft.

Beef broth will be found to be good for a change in diet. It should never be given in the form of beef juice without being cooked, as the meat may be diseased and the child will contract disease quickly.

GRUELS AND CEREAL JELLIES

Barley.—Barley-water, gruel, and jelly differ only in thickness. For barley-water use two level teaspoonfuls of barley flour. Make it into a paste with cold water and add to it a pint of boiling water, stirring continually to prevent lumps. Add a pinch of salt and cook for at least an hour, adding sufficient water at the end to make a pint of liquid. Strain through a cheesecloth or gauze strainer. If gruel or jelly is desired, use two to eight times as much flour to the same amount of water. Pearl barley may be used if necessary. The grains must soak overnight and be cooked for three to four hours. Use a heaping teaspoonful of the grains for a pint of water.

Oatmeal.—Have a pint of water boiling in the top of the double boiler; add half a teaspoonful of salt and drop in gradually half a cup of oatmeal flakes, stirring all the while. Then cook for three hours and strain through a wire sieve. Thin with boiling water to the desired consistency.

Rice and Wheat.—Rice jelly is made in the same way as barley jelly. The directions for cooking the various wheat preparations appear on the boxes, but all such preparations should be cooked at least three times as long as is there indicated and

should be strained and thinned to the proper strength with boiling water.

A fireless cooker is a great help in the preparation of cereals. If porridges are cooked for the family breakfast, a large spoonful of the cooked porridge may be added to a pint of boiling water, heated, stirred, and strained to make a thin gruel.

Corn-meal.—Corn-meal gruel is especially good for the nursing mother, as it seems to promote the flow of milk. Have a quart of boiling salted water and add a cup of fine, yellow corn-meal which has been stirred into a thick paste with a little cold water. Cook for two hours, adding boiling water as may be needed. Eat with milk and sugar, or as desired. Grits is also an excellent food, but needs long cooking.

FRUITS AND FRUIT JUICES

Orange and all other fruit juices should be strained through a wire strainer or a cloth, so as to remove every particle of solid matter, and in addition should be diluted by using an equal quantity of water for a baby of five months, gradually diminishing this amount until the juice is given pure.

Apples may be stewed or baked.

Prunes are prepared as follows: wash them well through several waters, then put them to soak overnight; cook them the next day in the same water. It will take only a little cooking to make them perfectly tender. A very little sugar may be added, but for a baby it is best to omit the sugar, as the fruit has its own sugar. The clear juice is laxative. In the second year the cooked fruit may be squeezed through a colander and the strained pulp given to the baby.

MEATS

Scraped Beef or Mutton.—Take meat, preferably from the round, free from fat. Place on a board and scrape with a silver spoon. When you have the desired amount of meat pulp, shape into a pat and broil on a hot, dry spider. Do not cook too long. When done, season with a little salt and butter and serve. A few drops of lemon juice may be added.

Beef Juice.—Broil lightly a piece of the round of beef, cut in strips, and squeeze the juice out with a meat-press or a large

lemon-squeezer. The juice may be extracted without cooking the meat at all. This is accomplished by soaking beef in cold water. Use a pound of chopped round of beef. Put it in a glass jar with one fourth as much water. Turn the jar upside down now and then and allow the meat to soak for several hours or overnight, keeping it on ice. In the morning, empty the whole into a coarse muslin bag and squeeze out the juice. Season with a little salt. This juice should not be cooked, but warmed slightly before feeding it, and may be added to milk if desired. If needed more quickly, put the beef in a bowl with crushed ice. Cover the meat and ice with a small plate weighted down with a flatiron.

Broths.—Chicken, beef, or mutton may be used as the basis of broth. Use a pint of water to each pound of the meat. Put the meat on in cold water and allow it to come to a boil, then lower the fire so that it will barely simmer for three or four hours. Or prepare it in the fireless cooker as directed for soup.

When the meat is tender, remove it and add enough water to make up the original amount of liquid; strain through a wire sieve and set it away to cool. When cold, the fat may be removed in a solid piece, leaving a clear liquid or jelly. Heat a small portion, seasoning with salt only. Broth has little or no nutritive value in itself, but if added to milk, or thickened with arrowroot, corn-starch, or gelatine, or eaten with dry bread-crumbs, it becomes a real food.

If it is desired to use the broth at once, pour out a little into a bowl or soup-plate and set the dish on the ice or in a pan of very cold water. The fat will rise and may be skimmed or strained off.

EGGS

Eggs are especially useful food for young children. The chief point to remember in preparing them is that they must not be overcooked or they are likely to cause indigestion, as experience has shown. The best ways of serving eggs for children are poached, soft-boiled, or coddled, though they may be scrambled for a change if one is careful not to scorch the fat used or to overcook the egg.

Many means have been suggested for cooking eggs in such a

way that the yolks will be cooked and the whites will not be overcooked. One of the most satisfactory is by coddling, which is done as follows: allow a cupful of water to each egg, bring the water to the boiling-point, remove it from the fire, put in the eggs, cover the dish closely, and leave the eggs in the water for about seven minutes.

HINTS IN THE CARE OF INFANTS

Baby should not be given a tub bath until the cord comes off, which is about the ninth or tenth day.

Baby should not be bathed too soon after feeding.

Baby's bath should be given in a warm room.

Baby's bath should be at a temperature of about 100° F. for the first month.

Baby's genital organs should be bathed at least once a day.

Baby's abdomen should be supported by a broad flannel band.

Baby's petticoat should be supported by shoulder-straps.

Baby's room should be at a temperature of between 64° and 70° F.; never below or above.

Baby's room should be aired at least twice a day.

Baby should not be taken out in sharp winds or when the snow is melting.

Baby needs plenty of fresh air to renew and purify the blood.

Baby should be weighed at least once every two weeks.

Baby should gain from five to eight ounces a week until he is six months old.

Baby should gain two to five ounces each week between six and twelve months of age.

Baby should weigh twelve or thirteen pounds when he is three months old.

Baby should weigh fifteen or sixteen pounds when he is six months old.

Baby should be able to hold his head erect when the body is supported, when he is three or four months old.

Baby should laugh aloud when he is four or five months old.

Baby should be able to sit erect when he is seven or eight months old.

Baby should be able to stand, with some assistance, when he is twelve months old.

Baby should make an attempt to walk alone when he is thirteen months old.

Baby should never be urged to walk.

Baby should say "Papa" when he is twelve months old.

BATHS

A healthy baby should be bathed every day. During the first two weeks these and all matters pertaining to the care of the baby are usually under the doctor's or nurse's supervision. When the mother takes charge of the baby she will find it convenient, usually, to give the bath before the midmorning feeding and after the bowels have moved.

The room should be comfortably warmed to about 72° F. It is not wise to have the room so hot that the baby perspires, as there is grave danger of his being chilled when, the bath over, he is taken into another room where the temperature is lower or when the room itself is rapidly cooled. It is better for the baby to have his bath in a room at ordinary temperature than in a bathroom which is heated by oil or gas. The baby should be protected from drafts by screens or by a shield made by hanging a blanket over the backs of two chairs. The full tub bath may be given as soon as the scar where the navel cord was attached has fully healed. An infant's bathtub serves every purpose for the first year of a baby's life or until he has outgrown it. A tiny baby may be bathed in a basin or bowl for some weeks. This basin should always be warmed before it is filled. The water should be at body heat or slightly above—that is, from 98° to 100° F.

A bath thermometer is an inexpensive convenience and should be provided, but if none can be had the mother may test the temperature with her elbow. When the water feels neither hot nor cold it will be comfortable for the baby. It should be tested after the baby is undressed and ready to get into the water. Hot water should never be added to the bath while the baby is in the tub. Never leave a young baby alone in the tub. Never put the baby in the bath while the tub is standing on a stove or heater; he might be seriously burned in this way.

No unnecessary exposure or delay should take place, for in cold or cool weather the baby is quickly chilled. To prevent this, all

the necessities, such as soap and towels, clothing, bath apron for the mother, tub, water, thermometer, powder, and the like, should be placed at hand before undressing the baby. In some cases it may be much more convenient for the mother to give the bath at night, just before the baby's bedtime. Never bathe a baby within an hour after feeding. A baby should always have his own towels and wash-rags. Soft cheesecloth makes excellent rags; the towels should be old and soft.

Before the baby is completely undressed his scalp should be washed, the head lowered a little to avoid getting soap in the eyes. Use a pure, bland, white, non-transparent soap. Very little soap is needed for cleaning a baby's skin, and it is most important that the skin be thoroughly rinsed. After the head and face have been washed and dried, remove the clothing and soap the entire body; then place the baby in the bath, holding him with the left forearm under the neck and shoulders, the hand under his arm, lifting the buttocks with the right hand, as shown in Illustration No. 4 (following page 256). Use the right hand to sponge the entire body, then lift the baby out and wrap him at once in a warmed towel. Dry carefully with soft, warm towels, patting the skin gently. Never rub the baby's tender skin with anything less smooth than the palm of the hand. Apply the binder as shown in Illustration No. 5 (following page 256). Dress as rapidly as possible if the weather is cold, taking great pains not to expose him unnecessarily. When the weather is very hot in summer, only a slip and diaper are needed.

If the skin is carefully dried after the bath, there will be little need for powder, and it should never be used as a cover for careless drying. It is well to use a little pure talcum powder in the creases and folds of the skin, under the arms, and around the buttocks, but it should not be used so generally as to fill the pores of the skin and clog them, and should be applied only after the skin is dry.

For one reason or another, a baby sometimes objects to his bath. In such cases judicious coaxing may be employed. Toys which float will often divert the baby's attention and make him forget his objections to the water. Sometimes lowering him into the water wrapped in a towel, or covering the top of the tub with a cloth, so that he cannot see the water, will accomplish the desired result. If his dislike is caused by having been put at some

previous time into a bath which was too hot or too cool, let him dabble in the water first with his hands and feet, until he is reassured. Sometimes the baby will cease his objections to the bath if his face is not washed until after the tub bath is over. Force or harshness is worse than useless in this as well as other matters in the training of the baby. The same result is accomplished if the baby is induced to the desired action by pleasant means and his sensitive nervous system is not upset.

Cool Baths.—The temperature of the bath may be gradually lowered until it is down to 96° F. for a baby of six months, and 90° for one a year old. Toward the end of the second year a robust baby may be given a cool sponge, but he should never be frightened or chilled in administering this wholesome treatment. He should be gradually accustomed to it by being allowed to stand in his tub at the end of his daily bath with his feet in the warm water, while a sponge of cooler water is squeezed over the throat and chest. The water may be made colder by degrees until he is taking it quite cool and enjoying it. He must be rubbed quickly and thoroughly at once, until the skin is red and glowing. If this reaction does not come, or if the child shows any appearance of chill or has cold hands and feet two or three hours after the bath, the treatment must not be repeated. Provided the glow always comes, a quick cool sponge, douche, or shower at the end of the bath is one of the best tonics that can be found and induces an excellent habit for after-life. After a cool bath the child should always have vigorous exercise for a few minutes in order to promote the necessary reaction.

Salt Bath.—Use half a teacupful of common or sea salt to each gallon of water. The salt should be dissolved in a cup of warm water to prevent the sharp particles from pricking the skin. The doctor sometimes orders a salt bath.

Starch Bath.—Add a cupful of ordinary cooked laundry starch to a gallon of water.

Soda Bath.—A soda bath requires two tablespoonfuls of ordinary baking-soda to a gallon of water, dissolving it in a little water before adding it to the bath.

Bran Bath.—Make a cotton bag of cheese-cloth or other thin material, six inches square. Fill loosely with bran. Soak the bag in the bath water, squeezing it frequently until the water becomes milky. Starch, soda, and bran baths are often used in

place of the ordinary soap-and-water bath when the skin is inflamed, as in chafing or prickly heat.

Sea-bathing.—Although a baby under two years should not be given a sea-bath, a word of caution about sea-bathing for young children may not be amiss. The cruelty with which well meaning parents treat young, tender children by forcibly dragging them into the surf, a practice which may be seen at any seaside resort in the summer, can have no justification. The fright and shock that a sensitive child is thus subjected to is more than sufficient to undo any conceivable good resulting from the plunge. On the other hand, a child who is allowed to play on the warm sand and becomes accustomed to the water slowly and naturally, will soon learn to take delight in the buffeting of the smaller waves, but he should not be permitted to remain more than a minute or two in the water and should be thoroughly dried, dressed immediately, and not left to run about the beach in wet clothing.

HOW TO LIFT THE BABY

To lift a young baby, slip the left hand under the back beneath the shoulders, spreading the fingers in such a way as to support the neck and head, and lift the feet and legs with the right hand. Never lift the child without thus supporting the spine. When a baby has learned to lift up his head and has gained considerable strength in the muscles of the back and neck, he may be lifted by grasping him with outspread fingers under the armpits, the body held firmly, so that the entire strain does not come on the shoulders. A baby should never be lifted by the arms. It is possible to dislocate the shoulder-joint by careless lifting. The proper and the improper way to carry a baby are shown by Illustrations Nos. 2 and 3 (following page 256).

HIGH CHAIR

A baby should not be put in the high chair until he is quite able to hold the spine and head erect, and should never be left in such a chair for any length of time. There is grave danger of producing a deformity of the spine if a baby is forced to maintain a rigid sitting position for long periods before bones and muscles

are sufficiently developed. Mothers should be on their guard to prevent the possibility of the baby being fastened in a high chair and left there to take care of himself during her absence, as maids and nurses may resort to this neglectful method of caring for the baby at such times.

TOYS

Since a baby wants to put everything in his mouth, his toys must be those that can safely be used in this way. They should be washable and should have no sharp points nor corners to hurt the eyes. Painted articles and hairy and woolly toys are unsafe, as are also objects small enough to be swallowed, and those having loose parts, such as bells and the like.

A child should never have so many toys at one time as to distract his interest. He will be quite satisfied with a few things for the time being, and a handful of clothes-pins, for example, will often please just as much as an expensive doll or other toy. It is an excellent plan to have a box or basket in which to keep empty spools and other household objects which the baby may play with.

CARE OF THE SPECIAL ORGANS

Eyes.—Whether the young baby is awake or asleep, his eyes should always be shielded from strong light, either sunlight or artificial, and from dust and wind. Care should be taken not to allow any soapy water to enter the baby's eyes in bathing. Should a little cold settle in baby's eyes, or the tear-ducts become clogged, forming a slight redness of the eyes, great relief can be given the baby by bathing the eyes with a small pellet of absorbent cotton which has been dipped in boracic acid solution, as shown in Illustration No. 8 (following page 256). Swelling or redness or any discharge should have medical attention at once.

Mouth.—A healthy baby's mouth needs no cleaning before the teeth come. The saliva is a sterilizing fluid, intended to keep the mouth healthy, and it is possible to injure the delicate tissues by attempting to clean them with a cloth. If the mouth must be washed, a swab made by twisting a piece of sterile absorbent cotton on the end of a clean stick should be used, as shown in

Illustration No. 9 (following page 256). Dip this in warm boiled water and wipe the gums very carefully. Never put a finger inside the baby's mouth unless in an emergency.

Ears.—Wash the external ear with a soft rag, but never attempt to introduce any hard instrument inside the ear to clean it. Always dry the ears and creases back of them very carefully.

Nose.—The baby's nose should be cleaned as a part of the daily toilet in the same way as the ears. When the baby has an infectious cold he should have special attention.

Genital Organs.—These organs in both sexes should be kept scrupulously clean, with as little handling as possible. Boys should be examined by a physician to see whether or not circumcision is needed. The foreskin should frequently be drawn back at bathing time and the organ cleansed. If the mother finds it difficult to retract it, she should not attempt to do this alone, but should ask the doctor to show her how. Perfect cleanliness is the principal treatment required in girl babies. If nervous symptoms appear the baby should be examined by a physician. Any swelling or redness of the parts or a discharge, however slight, should be brought at once to the doctor's attention.

CREEPING-PEN

A creeping-pen affords the necessary protection to the baby and gives room for exercise. It consists of a fence made in four sections, each, say, eighteen inches high and four feet long, hinged at three corners and latched at the fourth. Ready-made pens have spindles like a stair rail, so that the baby may have something to take hold of when he tries to climb to his feet. As it folds together, the pen can be readily moved about. The floor of the pen should be made of something soft to save the baby from bumps. A cork mat is the cleanest and best material, but a blanket or rug will answer. When the pen is used in the yard a floor of clean white sand will not only protect the clothing but afford the baby who is old enough to play by himself much wholesome entertainment. A combination bed and play-pen, the sides of which are covered with wire netting, is on the market. The bottom is made of flexible slats and covered below with netting. The bed has a cover so that the baby is completely protected from flies and mosquitoes, and is perfectly safe. It is furnished

with casters, or wheels, so that it may be moved about readily, and it may be folded up when not in use.

When it is not possible to purchase one of the ready-made articles an ingenious person may devise a satisfactory play-pen from any materials at hand. A board six or eight feet long and a foot wide may be used to fence off a sunny corner of the nursery for a pen.

SLEEP

The infant brain increases its size two and a half times in the first year, a greater growth than takes place during all the remaining years of life. At the same time this enormous brain development is taking place, the other organs of the little body are growing rapidly. During sleep the body tissues are recreated and the energy and materials needed for the activity of the waking hours are stored up. It is manifest, therefore, that the baby must have a correspondingly large allowance of sleep. He should be provided with the best possible sleeping accommodations, so that the hours of sleep may be of the greatest value to him. He should always sleep in a bed by himself, and whenever possible in a room by himself, where he need not be disturbed by the presence of other persons, and where light, warmth, and ventilation may be adjusted to his particular needs. Not a few young babies are smothered while lying in the bed with an older person, some part of whose body is thrown over the baby's face during heavy sleep.

Amount.—A young baby sleeps eighteen or twenty hours out of twenty-four. At six months of age, a baby sleeps about sixteen hours; at one year, about fourteen hours; and at two years, at least twelve hours. Daytime naps should be continued as long as possible.

INFANT STOOLS

The first passages from a new-born baby's bowels are known as meconium. The excretion is black or nearly so, and is thick, of a tarlike consistency, with little or no odor. This soon changes to the normal yellow stool of the healthy infant as the baby begins to feed at his mother's breast. The stools are then of a dull yellow or orange color without disagreeable odor, and soft

and mushy in appearance. They are passed from one to three times a day, averaging twice a day in most breast-fed babies until six months of age, when one stool a day is usual. When there is a long interval between feedings the number of stools is usually lessened, being only one a day, and sometimes only one in thirty-six hours. Artificially fed infants usually pass but one stool a day, and the color and odor vary with the character of the food. With breast-fed babies the stool is a mass, while with those fed on the bottle there is more tendency to a "formed" stool.

When there is a greatly marked difference in the character of the stools, especially when the number increases, the mother should have a doctor see the baby, meanwhile decreasing the food or, better, withdrawing it altogether for some hours, giving water instead.

In order to do away with the need for diapers as early in life as possible, the baby should be taught to use the chamber. This training may be begun by the third month, or even earlier in some cases. It should be carried out with the utmost gentleness, since scolding and punishment will serve only to frighten the child and to destroy the natural impulses, while laughter will tend to relax the muscles and to promote an easy movement. In order to be effective the chamber must be presented to the baby at the same hour every day, usually just before the morning bath, and it must be presented persistently each day until the habit is formed. Much time and patience will be required on the part of the mother, but in the end the habit thus formed will be a great saving of trouble to her and of untold value to the child, not only in babyhood but throughout the whole of life.

Experience has shown that an ordinary porcelain cuspidor is an excellent vessel to use for a young baby. It should be kept scrupulously clean, and in cold weather must be warmed before being used. The mother takes the vessel in her lap, seating the baby upon it with his back toward her breast, so that she may support him in a comfortable position. If the movement does not come within a few minutes the better course is to wait until the next day. A little observation on the mother's part will lead her to know at what hour the baby's bowels are ready to move, and she should choose that moment for the trial. If the baby has a tendency to be constipated, it may be well to

introduce a well-oiled soap stick for a moment before beginning, in order to start the movement and to indicate to the baby what is wanted.

CLEANLY HABITS

Children should be taught very early that it is not safe to use a handkerchief that has been used by someone else, and for similar reasons the use of individual towels and wash-cloths should be insisted upon.

A baby should be taught to blow its nose, to submit the tongue and throat to inspection, to gargle, and to regard the doctor as a friend whose visits are to be looked forward to with pleasure. Attention to these suggestions will make the task of a physician at some critical time far less difficult than it otherwise might be. If a baby has sometimes been threatened with a visit from a doctor as a means of securing obedience, his fear may be a serious drawback to successful treatment.

BAD HABITS

Some of the bad habits which a baby learns are these:

Crying.—Crying ought not to be classed as a bad habit without some modification, for although a well trained baby does not cry very much he has no other means of expressing his needs in the early months of life, and his cry ought to be heeded. But when baby cries simply because he has learned from experience that this brings him what he wants, it is one of the worst habits he can learn, and one which takes all the strength of the mother to break. Crying should cease when the cause has been removed. If the baby cries persistently for no apparent cause, the mother may suspect illness, pain, hunger, or thirst. The first two of these causes will manifest other symptoms, and the actual need for food may be discovered by frequent weighing. But if finally, after careful scrutiny of all these conditions, no cause for the crying can be found, the baby probably wants to be taken up, walked with, played with, rocked, or to have a light, or to have someone sit by him—all the result of his having learned that crying will get him what he wants, and sufficient to make a spoiled, fussy baby, and a household tyrant whose continual demands make a slave of the mother. It is difficult

to break up this habit after it has once been formed, but it can be done. After the baby's needs have been fully satisfied he should be put down alone and allowed to cry until he goes to sleep. This may sound cruel, and it is very hard for a young mother to do, but it will usually take only a few nights of this discipline to accomplish the result. In some cases persistent crying may be due to causes not readily discernible by the mother; in this event, the opinion of a good doctor as to the cause of the crying should be sought.

"Pacifiers" or "Comforts."—The extremely bad habit of sucking a rubber nipple, or a sugar ball, or a bread ball, or any other similar article, is one for which someone else is entirely responsible. The baby does not teach himself this disgusting habit, and he should not have to suffer for it. Some of the evil effects ascribed to this habit are that it spoils the natural arch of the mouth by causing the protrusion of the upper jaw; it induces a constant flow of saliva and keeps the baby drooling; the pacifier is never clean and may readily carry the germs of disease into the baby's mouth; and last and least, it is a habit which is particularly disfiguring to the baby's appearance. The pacifier, of whatever variety, must be destroyed, and no such object should be permitted in the baby's mouth under any circumstances.

Thumb or Finger Sucking.—This is another habit leading to the same results as the use of pacifiers, but one which the baby may acquire for himself, although it is frequently taught to him. To break up either habit requires resolution and patience on the part of the mother. The thumb or finger must be persistently and constantly removed from the mouth and the baby's attention diverted to something else. The sleeve may be pinned or sewed down over the fingers of the offending hand for several days and nights, or the hand may be put in a cotton mitten. Ill tasting applications have very little effect. There are patent articles for holding the hand from the mouth sold in the stores, but the persistent covering of the hand often works very well. The baby's hand should be set free now and then, especially if he is old enough to use his hands for his toys, and at meal-times, to save as much unnecessary strain on his nerves as possible, but with the approach of sleeping-time the hand must be covered.

Bed-wetting.—It requires great patience and persistence on the mother's part to teach the baby to control the bladder. Some babies may be taught to do this during the day by the end of the first year, but it is ordinarily not until some time during the second year that this is accomplished. It is necessary to put the baby on the chamber at frequent intervals during the day. Bed-wetting may be due to some physical weakness if it persists in children three years old and over. A doctor should be consulted. In ordinary cases it may suffice if no liquid food is given in the late afternoon and if the baby is taken up the last thing before the mother retires.

Masturbation.—This is an injurious practice which must be eradicated as soon as discovered, if at all, as it easily grows beyond control. It is more common in girls than in boys. If the mother discovers the baby rubbing its thighs together or rocking backward and forward with its legs crossed, she should divert him at once to some other interest. Nursemaids sometimes ignorantly rub the genital organs of babies, thinking that it quiets them, but nothing could be more deplorable than this. Mothers cannot be too watchful of nursemaids and the methods they employ to quiet or amuse a baby. Children are sometimes wrecked for life by habits learned from vicious nursemaids and mothers cannot guard too strictly against this evil. Another way in which this habit is learned is by means of playthings which rub upon the sensitive parts, such as rocking-horses, swings, teeter-boards, and the like. The habit may also be due to some local irritation, and it is wise to consult the doctor at the first evidence of the trouble. In the case of babies, the treatment consists in mechanical restraints. A thick towel or pad may be used to keep the thighs apart, or at night the hands may have to be restrained by pinning the nightgown sleeves to the bed, or the feet may be tied, one to either side of the crib. Wet or soiled diapers should be removed at once. Cleanliness of the parts is of great importance.

PUNISHMENT

Harsh punishment has no place in the proper upbringing of the baby. A baby knows nothing of right or wrong, but follows his natural inclinations. If these lead him in the wrong

direction, the mother must be at hand to guide him in another and better one and to divert his eager interest and energy into wholesome and normal directions. This is the golden rule in the training of babies, and one which applies to the training of children of all ages. Many parents conceive that their whole duty is to thwart and forbid, enforcing their prohibitions with penalties of varying degrees of severity, forgetting that they are dealing with a sensitive being endowed with all the desires, inclinations, and tendencies that they themselves have, and that if these natural feelings are continually suppressed and thwarted, they are sure to seek and find some outlet for themselves. A child who is often punished may be so dominated by fear of his parents that, the natural expression of his vital interests being denied him, he becomes sullen and morose as he grows older.

EARLY TRAINING

The training in the use of individual judgment can be begun even in infancy; a child should early be taught to choose certain paths of action for himself; and if he is continually and absolutely forbidden to do this or that, he is sometimes seriously handicapped later, because he does not know how to use his own reasoning faculties in making these choices. On the other hand, obedience is one of the most necessary lessons for children to learn. A wise mother will not abuse her privilege in this respect by a too exacting practice. For the most part, she can exert her control otherwise than by commands, and if she does so, her authority when exercised will have greater force and instant obedience will be more readily given.

Most of the naughtiness of infancy can be traced to physical causes. Babies who are fussy, restless, and fretful are usually either uncomfortable in some way because they have not been properly fed and taken care of, are sick or ailing, or have been indulged too much. On the other hand, babies who are properly fed, who are kept clean and have plenty of sleep and fresh air, and who have been trained in regular habits of life, have no cause for being "bad" and are therefore "good."

It must not be forgotten that the period of infancy is a period of education, often of greater consequence than any other two years of life. Not only are all the organs and functions given

their primary education, but the faculties of the mind as well receive those initial impulses that determine very largely their direction and efficiency through life. The first nervous impulse which passes through the baby's eyes, ears, fingers, or mouth to the tender brain makes a pathway for itself; the next time another impulse travels over the same path, it deepens the impression of the first. It is because the brain is so sensitive to these impressions in childhood that we remember throughout life things that have happened in our early years, while nearer events are entirely forgotten. If, therefore, these early stimuli are sent in orderly fashion, the habits thus established, and also the tendency to form such habits, will persist throughout life.

BABY'S DAY

6 A.M., baby's first nursing.
9 A.M., baby's bath, followed by second nursing.
Baby sleeps until noon.
12 to 1.30 P.M., baby's noon meal.
Out-of-door airing and nap.
3 to 3.30 P.M., afternoon nursing.
Period of waking.
6 to 7 P.M., baby's supper and bed.

It is quite feasible to have the baby's night meal at 11.30 or 12 o'clock, in order to give the mother a chance to spend an occasional evening in pleasant recreation.

PLAYING WITH THE BABY

The rule that parents should not play with the baby may seem hard, but it is without doubt a safe one. A young, delicate, or nervous baby especially needs rest and quiet, and however robust the child, much of the play that is indulged in is more or less harmful. It is a great pleasure to hear the baby laugh and crow in apparent delight, but often the means used to produce the laughter, such as tickling, punching, or tossing, makes him irritable and restless. It is a regrettable fact that the few minutes of play that the father has when he gets home at night, which is often almost the only time he has with the child, may

result in nervous disturbance of the baby and upset his regular habits.

The mother should not kiss the baby directly on the mouth, nor permit others to do so, as infections of various kinds are spread in this way. She needs also to be cautioned about rocking the baby, jumping him up and down on her knee, tossing him, shaking his bed or carriage, and, in general, keeping him in constant motion. All these things disturb the baby's nerves and make him more and more dependent upon these attentions. But this is not to say that the baby should be left alone too completely. All babies need "mothering," and should have plenty of it. When the young baby is awake he should frequently be taken up and held quietly in the mother's arms, in a variety of positions, so that no one set of muscles may become overtired. An older child should be taught to sit on the floor or in his pen or crib during part of his waking hours, or he will be very likely to make too great demands upon the mother's strength. No one who has not tried it realizes how much nervous energy can be consumed in "minding" a baby who can creep or walk about, and who must be continually watched and diverted; and the mother who is taking the baby through this period of his life will need to conserve all her strength, and not waste it in useless forms of activity.

FRESH AIR

Air is the first condition of life and growth. It is possible to live without food for days and without water for hours, but if a person is deprived of air for a few moments life ceases, because the bodily processes cannot go on without oxygen. Children who spend a large part of their time indoors, and especially those who must live or work in close, hot, overcrowded rooms or houses, are apt to be dull, listless, pale, and under-developed. The growing use of flats and apartments with tight doors and windows and modern heating systems is partly responsible for the alarming spread of diseases of the throat and lungs not only among children but among adults as well. The system becomes weakened and less resistant to disease by too high temperatures and by lack of constant and sufficient fresh air. A child should not be allowed needlessly to suffer this handicap to his development.

Many parents do not realize that to deprive a child of sufficient fresh air is quite as serious a matter as to deprive him of sufficient food.

A child should be out in the air after it is one month old. The best time of the day is from 10 A.M. to 2 P.M. in the winter and from 9 A.M. to 4 P.M. during the summer.

In winter, besides the normal amount of clothes required, the child should be wrapped in a woolen blanket, special attention being paid to the feet, over which the blanket should be folded; also to the hands, which should be underneath the "wrapped around" blanket, this being well tucked up around the neck. A warm cap should be put on, covering the ears, and if the day is windy and very cold, a veil should cover the face. Always have the child in the sunlight, but do not allow the direct rays of the sun to shine in its eyes. A new-born child should not be kept out for more than thirty minutes at a time, and then should be carried in the arms of its mother or nursemaid; in this way it does not become chilled. After it is three months old the carriage may be used and the time outdoors increased.

In summer the clothes should be light yet sufficient to keep the body warm and covered. Keep the child in a place where the sun is shining, yet not under the direct rays of the sun but in the shade. The amount of time that it should be kept out depends upon the day. If warm and dry, all day. If very hot, then just during the cooler hours and then in the shade. If the day is warm and rainy, cover and protect the child from becoming chilled or from getting wet, but by all means, no matter what the day is, give it some fresh air, even though it may be only an hour or so.

VACCINATION

Babies should be vaccinated before teething begins. There is less disturbance from it earlier than later, provided the baby is healthy. A suitable time is at from three to six months of age. The sore made by vaccination should not be covered by any shield which is impervious to air, but must be lightly protected. Various methods are used by physicians, but one of the simplest is to cover it with a loose, wide bandage of sterilized gauze, or old linen (recently boiled, to make it perfectly clean). An old handkerchief makes a good bandage, and any of these may be

sewed or pinned inside the sleeve. If the bandage becomes wet with the discharge from the sore and sticks to the scab, it should not be pulled off, but the cloth may be cut away around it and a small piece left adhering. The bandage should be changed once or twice a day, or as often as necessary to keep the wound perfectly clean.

HOW TO TAKE THE TEMPERATURE

The baby should be placed across the mother's lap with his head to her left, as shown in Illustration No. 10 (following page 256). With the right hand, slowly insert the bulb end of a clinical thermometer, which has been first dipped in vaseline, in the anus (the opening of the bowel). Direct it toward the back and hold it in four minutes. At least two thirds of the length of an ordinary clinical thermometer should be visible. Great care must be taken to hold the baby's legs so firmly that the thermometer is not broken.

The thermometer should never be placed in a baby's mouth as shown in Illustration No. 11 (following page 256), as the child may be irritable, and bite on the frail instrument, breaking it, and possibly swallowing the mercury, thus endangering the baby's life.

CLOTHING

Clothing should always be adapted to season and climate. A baby is comfortably dressed when his clothing is warm enough without being too warm. If he is too warm, the baby will perspire; if not warm enough, he will have cold hands and feet or become blue about the mouth. Little babies need to be kept warm, and gradually accustomed to cooler conditions, but older babies are often overdressed. A baby that is continually dressed in clothing which is too warm becomes pale and languid and instead of being protected is more liable to colds and bowel troubles. The mother should feel of the baby's body occasionally, and if she finds it constantly moist the clothing is too warm. In addition, clothing must be loose, so that all the little growing and expanding muscles and organs may have plenty of room to develop; it must be soft and smooth, so that the tender flesh

will not be irritated; and, finally, it must be clean and dry. When these conditions have been secured it does not matter in the least how plain and simple the garments are.

BANDS

Bands are unhemmed strips of flannel, from six to eight inches wide and eighteen inches long, and are used to hold the navel dressing in place. The knitted band with shoulder straps should be substituted for the flannel band as soon as the navel has healed. Bands of any sort must never "bind." A band, if drawn tightly about the abdomen, instead of preventing rupture may produce it, especially if the pressure is in the wrong place. The abdominal muscles of a healthy baby need little support, save, perhaps, in the earliest weeks of life; rather they need free play in order to be strengthened in the natural way by the slight exercise the baby can give them.

SHIRTS

Baby shirts come in four weights and several sizes. It is well to begin with the second size, as the first is soon outgrown. These shirts, as well as the knitted bands, are made of all wool, or of wool and silk, wool and cotton, or all cotton. Either the all cotton, the cotton-and-wool, or silk-and-wool mixtures are best. The shirts should open all the way down in front.

Many physicians prefer cotton or linen undergarments for children of all ages. They believe that woolen underclothing is responsible for many of the "colds" and similar ailments from which children suffer. Cotton garments do not overheat nor irritate the skin, and at the same time they readily absorb moisture. A summer weight and a winter weight should be used, and all other additions to the baby's clothing made according to the temperature. Extra wraps must be used when he is taken out. This rule applies especially to children living in overheated apartments and houses where the indoor temperature resembles that of summer much of the time. A child wearing underclothing that is too warm in such an atmosphere is made unduly sensitive and becomes a ready prey to infection of various kinds. In the north, or in winter, or in case the house cannot be easily

or sufficiently heated, or for very young or weakly babies, shirts and bands which are part wool are advisable.

PETTICOATS

Light-weight part-wool flannel may be used for the petticoats, which for very young babies should not extend more than ten inches below the feet. They may be made by the "princess" or "Gertrude" model if warmth is desired, but for summer they should be made with a cotton waist, as in the case of older children. Petticoats should always hang from the shoulders.

SLIPS

Slips should be made of some very soft material, such as cambric, nainsook, long-cloth, or batiste. They should not be more than twenty-eight inches long and should be very simply made. Care must be taken not to have anything about the neck that will scratch or irritate the tender skin as eczema may be caused in this way. Starch is positively forbidden in a baby's clothes.

WRAPPERS AND NIGHTGOWNS

Wrappers, either flannel or cotton, according to the weather, may be used in the place of slips, and in summer they do away with the need for petticoats as well. The only value of a long petticoat is to provide extra warmth and to make it easier to handle a little baby, while the white slip serves only to keep the petticoat clean and to complete the conventional idea of a baby's toilet; therefore a simple wrapper which opens all the way down the front saves time and trouble for the mother and gives the baby comfort. Besides flannel, other materials may be used, such as challis, nun's-veiling, cashmere, Henrietta-cloth or any other light, soft material which can be readily washed. Outing-flannel may be used, but the fuzzy surface of the cotton flannels is highly inflammable and great care must be taken not to allow a spark of fire to reach the baby when wearing such a garment. These wrappers may be worn as nightgowns when the baby is older. Nightgowns and wrappers, both short and long, may be bought ready-made, a very satisfactory sort being made of stock-

inet. Winter nightgowns have a draw-string run through the hem so that they may be drawn up to protect the baby's feet.

DIAPERS

The diaper is by far the most troublesome part of the baby's outfit. The ordinary cotton or linen diaper made of "bird's-eye," domett flannel, or terry-cloth is open to objections. In the first place, a large number must be provided, which involves a considerable outlay of time and money on the mother's part. Then, as no diaper is fit to use a second time without having been washed and dried, the care of these garments adds to the labor of the household. In addition to these objections the ordinary diaper is hot and clumsy, not to speak of the objectionable odor which clings so persistently to it. There is evidence to show that a wad of thick materials between the legs may deform the thighs to some extent. Besides, unless the diaper is most carefully washed, with soap that contains nothing to irritate the skin (a bland white soap is best), is thoroughly rinsed, and well dried in the open air, there is danger that the baby's flesh may become chafed and sore, especially when hot, non-absorbent material, such as Canton flannel, is used.

Pads.—But since diapers are necessary, some practical substitute for those in common use may be found. If an outside diaper is made of cheese-cloth, or some other thin, soft, loosely woven material which is easy to wash, an inside pad may be used to catch the discharges. If this pad is made of something which may be destroyed, the most disagreeable part of the washing will be done away with; but even if the pad must be washed, the time and labor involved in washing pads will be much less than in washing an entire diaper. Washable pads may be made of any soft material at hand, such as old Turkish towels or knitted underwear, or other material having a loose texture. Smooth materials, however soft, do not hold the discharges as well. Terry-cloth, a material resembling Turkish toweling, makes excellent pads after it has been washed a few times to render it more readily absorbent.

Recently, Sphagnum moss has been adopted for these absorbent pads. This moss has also found great favor in the war hospitals of Europe in the dressing of the soldiers' wounds, and

has given as good or better satisfaction than absorbent cotton. The moss is that which florists use for packing plants and grows very extensively in the swamp regions of the United States, but it needs to be thoroughly dried and cleaned of sticks and stems before being used for this purpose.

Such a pad (i.e., a pad of Sphagnum moss inclosed in cheesecloth) weighing only an ounce will completely absorb and retain a quarter of a pint of urine—say as much as would be passed in the night. This is infinitely cleaner and healthier than allowing the urine to spread over a wide area of napkin and night-dress, and thus cause extensive chilling and more or less irritation of the skin. Dry Sphagnum forms an extremely light, clean, airy, elastic pad, which will yield in any direction and accommodate its shape to the parts.

Those living in the country where this moss grows may find it a great convenience to pick and dry the moss for this or other domestic purposes. Paper seems to promise the greatest possibilities for general use, and with the rapid increase in the manufacture of absorbent, or "bibulous" papers, as they are called in the trade, it is to be hoped that a satisfactory, effective, and cheap pad may be found even if an entire paper diaper does not prove to be practicable.

How to put on the Diaper.—The ordinary diaper is a square of material from one half to three fourths of a yard wide, folded diagonally and then folded again, as shown in Illustration No. 7 (following page 256), making four thicknesses of material. If the inner pad is used, this outer diaper need be folded but once and the extra thickness will be secured in the pad.

During the mother's waking hours the diaper should be changed as often as it is wet or soiled. In the night it should be changed when the baby is taken up to be fed.

SHOES AND STOCKINGS

It is very important to keep the baby's legs and feet warm. Stockings and diaper should meet, leaving no part of the leg exposed. If the weather is warm the baby usually will not require any covering for his feet, but in cold weather and in all weather when it grows cold toward night it is well for him to wear a pair of merino stockings. These need not be all wool; indeed, if of a

mixture of cotton they are much better, as they will not shrink. For an older baby, who is on the floor a good deal, stockings and soft-soled shoes are necessary for comfort, except during the heat of summer. All the shoes from the very first should be chosen to fit the natural shape of the foot, with broad toes and straight soles. Socks may be worn in summer, but in the cooler months the baby's legs should be entirely covered.

CLOAKS AND CAPS

Since a baby exercises very little when taken out in a carriage, he must be warmly wrapped. Cloaks should either be of warm woolen material or have an interlining of wool, or in cold climates both. For the "runabout" baby additional warmth is secured by the use of leggings, a sweater, overshoes, and mittens. In summer if a wrap is needed it may be of silk or cotton, although a cloak of challis, cashmere, or nun's-veiling has more warmth and at the same time is light in weight. Caps should not be thick enough to cause the head to perspire. A silk cap with an interlining of wool wadding or of flannel may be used in winter. In the coldest weather a little hood knitted of woolen yarn, having a cape to come down under the coat collar and protect the neck, is excellent. Silk or muslin caps may be worn in the milder months, or the baby may go bareheaded if protected from the sun. No starch should be used in the caps, as stiff strings or ruffles will scratch the delicate skin of the baby and may produce eczema. Cap strings and ribbons should be carefully examined after the child is dressed, to see that they are not too tightly tied. Frost-bitten nose or cheeks may result if the circulation is checked by tight ribbons.

HOW TO KEEP THE BABY WELL

The suggestions contained in the following pages are not intended to be a substitute for the care and advice of a physician. But since many mothers are so situated as to be unable to command the services of a physician at once, and since in any case there may be a delay in his arrival, it is well for the mother to understand something of the symptoms of illness and be prepared to deal intelligently with the emergencies that may arise

in connection with the care of her children. In all cases of illness the discretion and self-control of the mother are of infinite assistance to the doctor, and when the physician's services are not immediately available, the life of the child may depend on the coolness and wisdom of the mother.

The old and most pernicious idea that a certain amount of illness is the necessary accompaniment of infant life is happily fast dying. With the constant increase in the knowledge of the conditions that lead to sickness among children, it is seen that a very large proportion of such illnesses and deaths are preventable by the application of the well established rules for the proper care of babies. It should therefore be the aim of all intelligent mothers to learn how to save their children from needless illness.

It is said that nine tenths of all infant illness is due to improper feeding. Whether this is the exact proportion or not, it is quite certain that many babies suffer unnecessarily from mistakes in diet, and it is in this field that the intelligence of the mother is of the greatest value. Babies are usually born healthy, and if they are fed at the breast, or, when this is not possible, with strict regard to the rules for proper artificial feeding, and if they are given hygienic care in other respects and allowed to develop in a natural, normal way, there is little reason why they should be sick, and the responsibility for this rests finally upon the parents. In the following paragraphs is given some account of the minor ailments that may attack babies, together with a brief description of the symptoms of more serious illness, at the appearance of which medical advice should be sought whenever possible.

Most of these suggestions apply as well to older children, as there is no hard and fast boundary line to separate the ailments of infancy from those of childhood.

COMMON AILMENTS

Diarrhea.—The normal, healthy baby usually has one or two stools a day. If the number increases to four or more the mother should be on her guard against diarrhea. Diarrhea is a symptom of nearly all the disturbances of digestion in infancy, both of the mild and of the severe types. The doctor should be con-

sulted at once if possible, for even a slight attack of diarrhea, unless correctly treated, may lead to a severe disturbance such as cholera infantum. Diarrhea is far more frequent in summer than in winter. This is chiefly because the baby is directly affected by the hot weather so that he is more easily upset by his food. Therefore in hot summer weather all babies, and especially bottle-fed babies, should receive especial care. They should be kept as cool as possible. They should be outdoors except when it is cooler indoors; all unnecessary clothes should be removed, a band and diaper being sufficient clothing; frequent cool sponge baths should be given, and the amount of food on especially hot days should be reduced to two thirds of the ordinary amount, large quantities of water being given in addition.

The disease is more frequent in bottle-fed babies. If it occurs in a nursing baby, it is usually because the baby has been nursed too often or at irregular intervals, or has been given food other than milk. Extend the nursing interval and allow the baby to nurse only five or ten minutes. If the trouble continues, withhold the breast altogether for some hours until there is an improvement. Give a little water to drink now and then.

For bottle-fed babies, if the disturbance is slight, the amount of milk used in the feedings should be reduced by half, skimmed, and all sugar omitted. If the trouble is more severe, all food should be stopped, only plain boiled water should be given, and a physician should be consulted at once.

A baby takes some time to get back to full vigor after even a slight digestive disturbance, and the return to food must be gradual. It will take from ten days to two weeks to restore the normal condition of the digestive tract. A second attack of illness occurs much more readily than the original one.

Constipation.—A nursing baby often responds to this condition in the mother. The mother should have a free evacuation of the bowels each day. If she is regular and the baby is still constipated, he must be held over the chamber at exactly the same hour every day, in the effort to induce regular movements. Persistence in the establishment of a regular bowel habit in the baby prevents much of this trouble. Orange juice may be given once a day, an hour before his midmorning feeding, after the baby is six months old. Other remedies are suggested in connection with the treatment of the bottle-fed baby.

Constipation in a bottle-fed baby is more difficult to relieve. After the baby is five or six months old, oatmeal gruel may be found useful in this condition, and fruit juices as well. Orange juice may be given at five or six months, and the strained pulp of prunes or baked apple in the second year. Massage of the abdomen may be tried. Just before holding the baby over the chamber, undress him as much as necessary and let him lie on his back. Moisten the hand in warm olive-oil, albolene, or vaseline, and gently massage the abdomen, using a light circular movement and very little pressure. Begin just above the right groin, carry the hand to the ribs, then across the body and down on the left side. Keep this up for five or ten minutes, but do not let the baby become chilled.

Enemas are not to be commonly employed. If resorted to frequently, they cause the bowel muscle to lose its tone and soften and dilate the bowel wall. The ideal treatment consists in the education of the intestine in the regular, unaided performance of its natural function, which is best achieved by persistence in a suitable diet. Do not give drugs for the relief of this condition, save under the doctor's direction.

If the baby is constipated, a soap stick or a gluten suppository may be tried. Take a piece of firm white soap half an inch thick and about two inches long and shave it down toward one end until the point is about a quarter of an inch thick and perfectly smooth. Wet the soap stick or dip it in vaseline before using it. Hold the stick by the thick end, insert the other end in the anus, and allow it to remain in one or two minutes. Gluten suppositories may be purchased at a drug store and are accompanied by directions for their use.

If the baby is badly constipated and needs relief at once, an enema may have to be used. For a baby six months old or over use a pint of warm water (95° F.) in which a teaspoonful of common salt has been dissolved, and half as much or less for young babies. Or if the constipation is specially severe, one to two tablespoonfuls of warm olive-oil may be used instead of the salt solution.

To give an enema, use an infant syringe, which is merely a rubber bulb with a nozzle on one end. To fill it, squeeze the bulb while holding the nozzle under water; when the bulb is released it will fill with water by suction. Let the baby lie on its back

across the mother's lap, as shown in Illustration No. 14 (following page 256), having the buttocks somewhat elevated by means of a folded towel placed under the hips. This position will cause the water to run up into the bowel more readily and serve to catch any drip. Lift the baby's feet with the left hand and with the right introduce the nozzle, which has been greased with vaseline, inside the anus (the opening to the bowel), directing it toward the back. The operation will cause the baby little or no suffering if gently and slowly performed, although if he is badly constipated the starting of the movement may be somewhat painful. When the liquid has been injected, remove the nozzle and press the towel against the opening to the bowel to retain the water until the baby can be placed over the chamber. As the enema sometimes comes away as the nozzle is withdrawn, the mother's clothing should be well protected. If a fountain syringe must be used, the bag should be held hardly higher than the baby, or the water will have too great force.

Hiccough.—This is a spasm of the diaphragm. In infants it is usually due to an irritation of the stomach caused by overfilling the stomach or by swallowing air with the food. In some cases it may be brought on as the result of a sudden exposure to cold. Care should be taken to avoid these causes. When the trouble is in progress, gentle massage of the abdomen or placing the baby face downward across the mother's lap will sometimes afford relief. Giving the infant a few drops of water to drink may help.

Convulsions.—This is, to the mother, one of the most alarming illnesses of infancy. It is always a symptom of some disturbance and the cause may be slight or very serious. Accordingly, in case any sort of twitching or convulsive motions are noticed, it is wise to send at once for a doctor. If a convulsion occurs before the doctor comes, keep the baby as quiet as possible, with cold cloths to the head. An enema of warm soapy water may be given. Have plenty of hot water ready so that the doctor may give a hot bath if he desires. Constipation is one of the causes of convulsions and it is important to keep the bowels freely open if a child shows a tendency to this trouble. Do not feel alarmed if the physician administers chloroform, but never attempt its use yourself, as the slightest error in its administration may prove fatal.

Croup.—Catarrhal croup is one of the most alarming diseases of childhood, but it is practically never fatal. It is believed that children with enlarged tonsils and adenoids are more subject to it than others. The onset is very sudden. The child goes to bed apparently in good health and wakens a few hours later with a hoarse metallic cough most alarming to mothers, and loud, difficult breathing.

The baby should be taken up and warmly wrapped. The room should be made very warm and a kettle of water set to boil. If the house is piped with water, the hot water may be turned on in the bathroom or kitchen, all the doors and windows closed, and the hot moist atmosphere will soon cause the paroxysm to relax. If kettles of water must be used, the steam will be more effective if confined under a tent made from a large umbrella or a sheet thrown over the crib. A gas or alcohol stove may be used to keep the kettle boiling. There is a "croup kettle" on the market which is very convenient. It has a long spout which carries the steam where it is needed. Mild attacks of croup will often yield to the application of warm moist cloths about the throat, using great care not to burn the baby's flesh. When possible, the doctor should be summoned in order to make sure that the baby is not suffering from laryngeal diphtheria.

When the attack is over, all damp clothing should be removed and the room very gradually cooled, the child being kept warmly covered. Children who show a croupy tendency should be invigorated by much out-of-door life, nutritious food, daily cold sponging over the neck and throat, and should be examined for adenoids.

Cold in the Head (Coryza).—This ailment is particularly annoying to babies, because the obstruction of the nasal passages, making breathing difficult, greatly interferes with the ease of nursing. Serious complications may also follow a bad cold. These include bronchitis, pneumonia, tonsilitis, and abscess of the middle ear. A cold is a germ disease and very contagious. As far as possible, babies should be kept away from those suffering with this trouble, as it may be conveyed by a cough or a sneeze from the person affected. When a mother has a "cold," she should avoid kissing the baby or breathing directly in his face or using her handkerchief in his care. A nursing mother who has a cold should cover her nose and mouth with a towel or

handkerchief while the baby is at her breast, as shown in Illustration No. 12 (following page 256). Paper napkins, which may be purchased for a few cents a hundred, are a great resource at such a time, as they may be freely used and then burned. If the baby becomes infected, a few drops of albolene placed in each nostril by means of a medicine dropper will relieve the baby very much. The bowels should be kept open, and if there is fever the food should be reduced. Keep the baby in a room the temperature of which does not vary greatly during the twenty-four hours, but provide plenty of fresh air. Babies who live out of doors, who are fed properly and not too heavily dressed, are much less liable to colds than others. It is wise to keep careful watch over a baby thus affected, as certain contagious diseases appear first as a cold in the head.

Prickly Heat.—This disease is due to the heat of summer, or to unduly heavy underclothing. It manifests itself in a fine red rash which comes when the baby is overheated and fades away under cooler conditions. The rash often shows itself first on the back of the neck and spreads over the head and shoulders. It is a very annoying trouble and makes the baby fretful and restless.

If the rash appears in cold weather, the baby is too warmly dressed. Heavy flannels are to be avoided, and a thin cotton or silk garment should be worn next to the skin. When it is caused by summer heat, the baby should be made as cool as possible, dressed in the thinnest clothing, and frequently bathed in cool water. Soap should never be used on an inflamed skin, but a starch, bran, or soda bath will help to relieve the intense itching. Ointments are not so soothing in this condition as powders. A satisfactory powder is made by mixing one ounce each of powdered starch and powdered oxide of zinc with sixty grains of boric acid. Any druggist will make this up, and it should be used freely over the inflamed spots.

Chafing.—A fat baby is very apt to become chafed in the folds and creases of the skin, especially about the buttocks, where it is due to wet diapers or to those which have been washed with some irritating soap powder or not thoroughly rinsed. Chafed flesh should not have soap used upon it. Starch or bran water may be tried. Keep the skin clean and use the powder above recommended. In obstinate cases, clean with fresh olive-oil only, using no water.

Eczema.—This is one of the most persistent and annoying afflictions of babyhood. It is characterized by a swollen, reddened skin, often covered with tiny pimples or crusts, sometimes having a watery discharge; at other times dry and scaly. Some babies have a predisposition to the disease, and in them a slight cause is sufficient to produce it. A baby's skin is very delicate, and any irritation, such as chapping from exposure to cold wind or the use of hard water or strong soap, may lead to eczema, or it may be caused by woolen underclothing, starched bonnets and strings, or unclean diapers. The disease is also caused by digestive troubles due to overfeeding, and often appears in constipated babies. These causes suggest the measures needed for its prevention.

The disease should be treated by a physician, as it is very persistent and must have careful and constant attention. Neither soap nor plain water should be used on the affected parts, which are usually the head and face. Bran or starch water may be used if necessary.

All liquors should be excluded from the diet of a nursing mother, the amount of meat reduced, and her out-of-door exercise increased. For babies fed on cow's milk the diet should be much reduced, both in quantity and strength, and in older children the starchy foods restricted, potatoes and oatmeal being forbidden. It is of the greatest importance that the child have a free bowel movement every day.

To allay the itching, smear the surfaces with an application made of equal parts of lime-water and sweet almond-oil, or cover them with a starch and boric-acid powder. It is most important that the baby shall not scratch the inflamed skin, and to prevent it pasteboard splints may be bound lightly about the baby's elbows with strips of cotton. It will thus be impossible for him to get his hands to his face, while having their free use for other purposes. A doctor's help and advice are needed in this disease.

Milk Crust.—Yellowish, scaly patches sometimes form on a baby's scalp. To remove, anoint with oil or vaseline at night and wash with warm water and pure soap in the morning, but do not attempt to force the crust away. If it does not all come off, repeat the operation as many times as needed, but on no account use a comb or any hard instrument to remove it, as it is very easy to start eczema in such a way if the skin is broken.

Rickets.—This disease, characterized by imperfect development of the bones, is probably due to faulty food and improper living conditions. Breast-fed babies are rarely affected, although the baby of a nursing mother whose diet is poor, insufficient, or improper may have the disease. Feeding on condensed milk and proprietary foods is thought to be one of its causes. Prevention consists in giving the baby suitable food, fresh air, and plenty of sunshine, and the same measures will bring about the cure. The symptoms of this disease are bow-legs, prominent abdomen, restless sleep, a perspiring head, weakness, and tenderness of the flesh. The disease may usually be arrested by prompt treatment at the start. Medical advice should be sought.

Scurvy.—This disease is characterized by bleeding gums, great tenderness of the extremities, pallor, and fretfulness, and is probably due to improper diet. Suitable food and good care usually bring about immediate improvement. Fruit juices are needed, but they must be of an amount and kind suited to the child's age, and the case should be brought to the attention of a doctor, who will direct the treatment.

Adenoids and Enlarged Tonsils.—The symptoms which indicate that a baby is suffering from adenoids are restless sleep, snoring, snuffling, sleeping with the mouth open, and inability to nurse properly. All these conditions are due to the fact that these enlarged tissues partially close the nasal and throat air-passages so that the baby cannot breathe freely. Later the same causes may lead to deafness and other defects, which very seriously hinder the child's growth, both of body and mind. All babies who show any signs of trouble of this kind should be examined by a competent physician, who will decide how early the operation for the removal of these growths may be performed. Children suffer so seriously from this disease that no parent should be willing to have a child start out under such a handicap. In the hands of a careful surgeon the operation is a slight one, and in many cases the relief is immediate.

Colic.—This is caused by indigestion due to overfeeding, improper feeding, or too frequent feeding. The bowel is distended by gas, giving rise to severe pain. The baby cries sharply, alternately drawing its legs up to the body, then kicking them away. Sometimes a change of position will give the

baby relief, as shown by Illustration No. 13 (following page 256).

Do not feed the baby while the attack lasts. Though the introduction of warm milk into the stomach may quiet the baby temporarily, the pain will return with greater intensity. Warm water may be given if the baby will swallow it. Colic is peculiarly an ailment of young babies and usually disappears by the third or fourth month. It is also very common in breast-fed babies. Constipated babies are more liable to it than others, and attention should be given to remedying this condition as a method of preventing colic. Colic is also caused by cold.

Treatment.—The feet of the child should be kept warm by placing a hot-water bag to them, and also place a hot-water bag on the abdomen, but care must be taken that this is not too hot for the child to bear. In a very severe case of colic an enema consisting of one-half teacupful of warm water to which eight drops of turpentine have been added will very often give relief. Should gas have accumulated on the stomach, two or three drops of peppermint in a little warm water may also be given.

In closing this department, which we consider the most important one in this great work, we wish to impress upon the mother, or the nurse who may be intrusted with the sacred duty of bringing the infant safely through its early life, that the time to lay the foundation for a strong moral and physical body is during this period.

Where it is possible for a mother to nurse her infant, she should do so by all means, as a baby who is fed with nature's own sustenance has the physical advantage over the child who has been obliged, either through neglect or other causes, to be fed with artificial food. Rickets, diarrhea, and convulsions are three of the most dreaded diseases of infancy, but are practically unknown among breast-fed babies.

A mother under no circumstances should intrust the care of her child to a stranger, as it is a duty which she owes to her offspring to personally raise her family. The mother who, through lack of thought or otherwise, tries to pass that great responsibility on to someone else, cannot be too strongly warned against the danger to her child, for she must realize that it is impossible for the child to receive the same care and devotion from a stranger which only a mother is capable of bestowing.

OUR BABY

Baby arrived Hour Date

Doctor

Nurse

Weight Pounds Ounces

Height Feet Inches

First caller

Baby's name

First outing Date

Registered at

Christened at

Godfather

Godmother

Clergyman

First smile Date

Changed to short clothes Date

First attempt to creep Date

First photo Date

First tooth Date

Weaned Date

First word Date

First step Date

HEALTH IN CHILDHOOD

INTRODUCTION

NO period of history has been more concerned than our own with the study of childhood, whether from the point of view of the cure and prevention of disease or that of mental and moral education. And surely there is no science so pregnant with possibilities as this, which has as its aim the elimination of all that is productive of inferiority, whether it be physical or mental, and the production of a superior race.

It is only by the proper nurture of the child from his earliest days, long before he is born, that we can hope for any great improvement. The aim of the eugenists is to seek to educate public opinion to a greater ideal on the question of the reproduction of the human race. Great care is exercised in the matter of breeding animals, to insure that the very best are the progenitors of the future race. Not only is there selection beforehand but every care is taken that, during the immaturity of the young animal, the mother is under the best surroundings. Surely the time has arrived when the human mother should receive every care during this critical time.

There is no doubt that the public conscience is awakening to the crying need of some form of control. In the case of the feeble-minded their further restraint has become the burning question of the day. There is an enormous number of feeble-minded people in this country, and those who contribute to this total, in many cases, come from families where there was previously weakness of intellect. Many are the illegitimate children of weak-minded women, who have been subject to no control, but allowed to go on populating the country with children, of whom a large number will also belong to the same class of the mentally defective. We do not suggest that all cases of feebleness of mind arise in this way, but a very large number do. If steps could

be taken to stamp out this persistent source of weakness to the community, much would be done toward dealing with a difficult problem.

There are two solutions to this question. One is to segregate all feeble-minded persons, keeping the sexes apart. This, on account of the expense involved, is unlikely to be undertaken. Besides, it is unnecessary to resort to what is virtually imprisonment, for the other solution is a comparatively simple one, and obviates any necessity for separation of the sexes. This second alternative consists in the removal of the power of procreation. A simple, painless, and effective method of producing sterility without interfering with the liberty of the sexes consists in the exposure of the reproductive glands to the X-rays. Those who talk of the interference with the liberty of the subject, and the resort to barbarous practices, might well give a little more consideration to the welfare of the child. How can a child, even supposing he is normal, with one or both parents feeble-minded, be reared with proper care? He does not have a fair chance. The care of the child is a higher ideal than the care of the parent, for the well-being of the child is the salvation of the race, and the welfare of the race, as compared with the liberty of the individual, is paramount. This idea is universally recognized in so far as those who commit crime against the public weal are subject to drastic punishment by the curtailment of their liberty. This being so, wherein lies the heinousness of protecting posterity by the interference suggested?

Further awakening of the public conscience is required in reference to the care of the mother before her child is born. In many cases the mother has to work in factories and elsewhere until shortly before his birth. This must have a deleterious influence on the child. Then, too, there is the fact that in his early days, owing to the mother having to go to work, the little infant is left to the tender mercy and ignorance of some older sister or the carelessness of some neighbor, who for a pittance undertakes to look after him, with probably half a dozen more. Small wonder that under these conditions the infant mortality is high. The crippling in health, too, of those who do not succumb, often paves the way for an unhealthy childhood and a decadent manhood.

Not only is the child handicapped through inefficient nursing,

but his surroundings are often detrimental to his physique. This is particularly the case in towns, where large numbers of people are crowded into most inadequate accommodation, often consisting of only one room; where the houses are massed together, and back-to-back premises predominate; where the sun seldom enters, and the air is always impure. What is wanted is more air, more sun available for everyone.

The physical condition of the average child has been creating much concern in the minds of thoughtful people. This culminated a few years ago in the adoption of medical inspection throughout the schools in some States. Much was expected of this system, and much has been done, but the system is far from perfect yet. Defects are discovered in thousands, and in many cases before serious harm has arisen, but the plans for seeking to remedy these defects have so far proved unavailing in the majority of cases, owing partly to the apathy of the parent, partly to ignorance, but chiefly from inability to pay for the necessary treatment. Until there are adequate facilities for obtaining treatment at a reasonable cost, this great system must prove abortive. A large number of parents are being educated through the medium of medical inspection and associated agencies, and a larger number of children themselves are being taught the right principles of hygienic living. All these seeds may not bear much fruit in the immediate future, but they are bound to produce better results in the next generation. Our aim is the betterment of the individual and, through him, the improvement of the race.

The problem of child welfare has been approached from various points of view, but in this article the aim is to try to present the main features requisite to the physical and mental health of the child. An attempt is made to show some of the principles underlying the adoption of certain rules and thus form a rational basis of healthy living.

GROWTH

Under this term we propose to say a few words about certain conditions in which the child differs from the adult. One of the most noticeable is the increase in size, which is known as growth. This implies a relatively larger intake of food, for the body has not only to keep up its existing condition, but has to increase

in size and efficiency. This growth varies considerably in different individuals, depending partly on racial and partly on hereditary characteristics. However, the examination of large numbers of children furnishes data which give an average idea of the height and weight of boys and girls at various ages. The height is usually taken with the shoes off; the weight, in the indoor clothes without shoes. The accompanying table gives the average height and weight for children of all classes:

	BOYS			GIRLS		
Age last Birthday	Height Feet	Inches	Weight Pounds	Height Feet	Inches	Weight Pounds
5	3	4	40	3	3	39
6	3	7	44½	3	6	41¾
7	3	10	50	3	8	47
8	3	11	55	3	10½	52
9	4	1¾	60½	4	0¾	55½
10	4	3¾	67½	4	3	62
11	4	5½	72	4	5	68
12	4	7	76¾	4	7½	76½
13	4	9	82½	4	9¾	87
14	4	11¼	92	4	11¾	96¾
15	5	2¼	102¾	5	1	106¼
16	5	4¼	119	5	1¾	113

Growth is most active during the summer months. Boys at first grow more rapidly than girls, but from twelve years to fourteen or fifteen, girls, as they approach puberty earlier, develop more rapidly and increase in size at a greater rate. Boys continue to grow at an age long after girls have ceased.

It is advisable to have children measured and weighed at frequent intervals, in order that some definite idea may be gained of their growth, for this may have an important bearing on their health. Children who are growing very rapidly are using up a good deal of energy; this results in a diminished power of mental application and consequently work suffers in such cases.

If there is a considerable increase in height beyond the average, especially if this is not attended with a corresponding increase in weight, the child should be medically examined, as such a condition may indicate the onset of disease. Similarly, if there is a comparative cessation of growth, the same apprehension should be aroused. The stoppage may be due to insufficient or improper feeding, a deficiency in the amount of clothing, too

close an application to mental work, excessive work, or insufficient sleep, apart from any disease.

School work tends to retard growth. It is important, in weighing children regularly, to make sure that the amount of clothing is about the same and that the weighing takes place about the same time in the day. It has been found that in a child of ten years there may be a variation of 1½ lbs. between the morning and evening weight. This difference is due to the ingestion of food and drink during the day and the loss of moisture from the body at night-time. Usually, about the age of six years the permanent set of teeth begin to erupt. The order of emergence varies considerably in different children, but the following table shows the average:

First molars	6 years
Lower central incisors	7 "
Upper central incisors	8 "
Lateral incisors	9 "
First bicuspids	10 "
Second bicuspids	11 "
Canines	12 "
Second molars	12 to 13 "
Third molars (wisdom teeth)	17 to 24 "

The first to erupt are usually the molars. They come just behind the last of the temporary teeth and are especially important, as they are so liable to early decay owing to such close proximity to the decayed temporary molars.

Nearly all the tissues in children are more active than in adults, consequently there is a greater heat-production, but there is a greater heat-loss to counterbalance this.

The normal temperature of children is higher than in adults. It takes very little to raise the temperature in a child—nervousness, excitement, and exertion—and consequently it is important for a mother not to worry unduly should her child exhibit a raised temperature, provided it seems otherwise quite well. The breathing, too, is more rapid and more irregular than in the adult. The pulse-rate is quicker, gradually diminishing in frequency as the child gets older.

FOOD

In considering the question of diet one has to think of it from various points of view: (1) efficiency as a nutritive agent; (2)

usefulness as an aid to mastication; (3) efficacy as a laxative. All these points are of importance in reference to the well-being of the child. One is apt to think of the matter only from the standpoint of the amount of nutrition obtained. Of course this is the most important factor, but the others are not independent of it. The longer the food is masticated the more it is disintegrated and mixed with the saliva, and the more easily is it digested. Likewise the promotion of a natural action of the bowels, by inducing a healthier condition of mind and body, results in a better absorption of nutrients.

In children, as distinguished from adults, the body tissues have not only to be kept in repair and up to their normal level, and so require food for this, but they also have to increase in size owing to the growth. This implies a relatively greater intake of nourishment, and so the child for his size eats more than an adult. Besides, children lose heat more rapidly than adults, and so require a greater amount of food proportional to their size to make up for this loss.

Atwater calculates that children require a certain proportion of the food required for a man doing moderate work, the proportion depending on their age according to the accompanying table:

A child	3 to 5	years	needs	4/10	the	food	of	a man
A child	6 to 9	"	"	5/10	"	"	"	"
A child	10 to 13	"	"	6/10	"	"	"	"
A girl	14 to 16	"	"	7/10	"	"	"	"
A boy	14 to 16	"	"	8/10	"	"	"	"

The body tissues consist of proteins, fats, carbohydrates, mineral salts, and water. Consequently in feeding the body all these substances are required in greater or less proportion. The proteins are required for the repairing of tissue waste and for the building of fresh tissue. Fats and carbohydrates are used chiefly as fuel for the production of heat and energy. The function of the salts is still somewhat obscure, but they have much to do with nutrition. They are absorbed chiefly from vegetables and fruits.

Many foods contain all these substances. Often they are rich in one particular only; for instance, potatoes and rice are chiefly composed of starch, butter of fat, and fish of protein.

It is most important that the child's diet should be a mixed

one—that is, one containing all these alimentary principles—if health is to be maintained. Otherwise disease is liable to arise; for instance, rickets develops, owing partly to a deficiency in the amount of fat obtained, or scurvy, from a want of fresh vegetables.

Before entering more fully into the different foods which are suitable, it is advisable to consider the subject from the point of view of mastication. Mastication is the grinding of the food between the molar teeth until it has become quite disintegrated. This is a process which is usually ignored, particularly in the case of very young children. Usually children have all their milk teeth at the age of two and a half years, and consequently are able to chew their food quite well, but they do not do so because they have never been brought up to it. Their food from the time it started to become more solid has been of a mushy nature, and has been so broken up for them that there has been no incentive to start chewing it before it is swallowed.

This is a subject which is so important, not only from the point of view of diet, but from that of so many other conditions, such as the healthy state of the teeth themselves, the size of the jaw, and the onset of adenoids, that it requires to be particularly emphasized.

It is necessary that, from the start, the child should learn to masticate the food. Otherwise he develops the habit of bolting, and this is difficult to eradicate later on.

The importance of mastication, as far as diet is concerned, is that it causes the food to be thoroughly broken up and mixed with the salivary juice. This juice contains a ferment which converts starch into sugar. This process has to be carried out before any of the starchy food, such as bread, can be absorbed into the system. Not only does the saliva have this action, but it permeates the whole mass in the mouth and promotes the later digestion in the stomach.

Soft food cannot be masticated. There is nothing there to chew, and so the food slips down too soon. However, we regard certain foods like oatmeal and milk puddings as so beneficial to children that their soft character has to be overlooked. The starch in them is digested later on, after passing through the stomach. The beneficent effects of mastication cannot be obtained by trying to go through the process if food is not fit for

mastication. It is therefore useless to tell children that they must masticate their food without at the same time prescribing food which can be, and in fact requires to be, thoroughly masticated.

Not only does efficient mastication lead to greater digestibility, but it also leads to less food being consumed. Thus there is less waste.

The importance of a regular action of the bowels is so well known that it needs no further emphasis. In connection with this the diet is of material value. It seems almost unnecessary to state that the contents of the bowels which are evacuated, are the waste products or remains of the food taken, which are not required or have not been utilized for the body's needs. If food is taken in concentrated form, or too refined, there is little left over for excretion. This has a tendency to bring about constipation, owing to the smallness of quantity of the contents being insufficient to stimulate the bowel, and thus produce an evacuation. It is advisable that there be a certain amount of indigestible fiber which increases the bulk of the contents. This is obtained in the fibrous tissue which surrounds and incloses the more digestible constituents of vegetables, etc.

Before passing on to consider an average daily dietary, we propose to make a few general remarks on various foods and the best methods of cooking them.

All foods should be as pure as possible. No preservatives should be countenanced. Canned foods are better avoided; likewise cheap jams.

Eggs.—It is better to give eggs either soft boiled or poached. Care must be exercised in permitting eggs to be eaten, as they make some children "bilious."

Fish is best steamed.

Meat should be plainly roasted or boiled. Recooked meat should never be given.

Potatoes should be well cooked, so that there are no hard, indigestible lumps. If cooked in their skins, they retain their organic salts somewhat. Potatoes should be baked, when all their organic salts are retained.

Vegetables should be cooked by steam. It is better not to give any raw vegetables, unless it be lettuce or cress. These should always be very carefully washed, as it is supposed that

worms and germs often enter the intestinal canal through the eating of insufficiently washed, raw vegetables.

Puddings.—Steamed puddings are preferable to boiled. Milk puddings, such as rice and sago, are best cooked slowly in the oven for about three hours.

Fruits.—All fruits should be fresh and ripe. The skins should be removed. It is advisable to give children raw fruit, such as an apple, to terminate each meal, with the idea of removing any starchy particles of food from the crevices of the teeth. The amount should depend on the individual child. Children who are inclined to looseness of the bowels may be able to take little or none, while those who have a tendency to constipation may require a considerable amount.

Currants may pass undigested through the alimentary canal, and in some children they produce irritation, so it is wiser not to give them.

Bread.—Whole wheat bread is undoubtedly the best for children; next to this, Graham and rye bread should by all means be preferred to white. The white bread made from bleached wheat flour has practically no food value. If constipation is habitual, bran bread is very valuable. The chief thing is that the bread should be clean and pure. It must be well baked, and the child should be encouraged to eat the crusty parts. Neither new bread nor hot rolls should be permitted.

Oatmeal is an admirable food for most children, especially if eaten with plenty of milk. It contains a good deal of nitrogenous food and some fat in addition to its starchy elements. Many children, however, dislike it, and in some cases it has an irritating effect. Cracked oats is the most appetizing but takes a long time to cook. Flaked oats is much more easily prepared and possesses greater food value. It is very digestible and is free from the husks.

Condiments are unnecessary, and it is unwise to give them, with the exception of salt, of which a small portion should be given each day with the food.

Fat of meat is unpalatable to most children, and to force them to eat it in this form is inadvisable. They can get quite enough in a more appetizing form, such as drippings, butter, bacon fat, or cream. This last is an excellent and more palatable substitute for cod-liver oil.

Do not give rich or highly seasoned foods, such as pork, game, goose, duck, rich stews or sauces, pickles, spices, highly flavored cakes, or pastries.

Sweets should not be debarred altogether, as they permit of the entrance of sugar in a palatable form; however, they should be pure and free from extraneous coloring-matter. They should preferably be of the kind that do not leave much sticky substance clinging to the teeth. It is better not to eat them between meals.

Some children may be able to take with impunity what would prove a veritable poison to others, while certain children have their digestive apparatus so delicately balanced that even an apparently harmless food may prove deleterious. Thus experience has to decide what the individual child should avoid.

The diet should be as varied as possible, as monotony is often conducive to lack of appetite. Regularity in the hours of meals is very essential, and the time should be kept to, punctually.

The following summary gives an idea of the day's diet for a normal child:

Breakfast, 8 A.M.—This should start with fruit, as orange juice, oatmeal or other breakfast food and milk, after which a suitable amount of egg, bacon, or fish should be taken, accompanied by bread or toast. Butter is unnecessary with bacon. Warm milk should be given to drink,—a cupful. It should be taken toward the end of the meal. Tea or coffee should be postponed as long as possible, and when taken it should be weak.

Lunch, 11 A.M.—A glass of warm milk with a well baked plain biscuit or rusk.

Dinner, 1 P.M.—Meat, chicken, or fish, with potatoes. A second vegetable is advisable, such as beets, string beans, peas, cauliflower, etc. This should be followed by milk or light steamed puddings. For older children, a little home-made pastry ought not to do any harm. A little fruit and a glass of water should end the meal.

Tea, 4.30 P.M.—This should consist chiefly of bread and butter or toast. If jam or honey is given, it should accompany the butter and not replace it. A little plain, preferably home-made cake may be taken. This meal consists almost entirely of starchy food, which clings to the teeth, so that some fruit should terminate it.

Supper, 6.30 P.M.—This should consist of a light meal, composed of easily digested foods. Older children, especially after sports or arduous exercises, would benefit by something more substantial in the shape of an egg or some fish, etc. Milk, with malted milk or ovaltine and other similar nutritious foods added, should be the beverage and should be taken almost the last thing.

CLOTHING

On no subject dealing with children's physical well-being is there more lack of common sense than in the matter of clothing. To get some idea as to the rational lines on which children should be clothed, it is necessary to understand the functions of the skin. The skin, besides getting rid of waste products of the body in the form of sweat, has one other supreme function, viz., the regulation of the body temperature. This has to be maintained at a certain level. This temperature is the result of chemical changes going on throughout the body. These changes are produced by the assimilation and combustion of food in the tissues. If there is a deficiency in the amount of food, it is made up by calling on the body tissue itself to supply the want and thus enable a requisite amount of heat to be generated. To prevent this production of heat from becoming too great, heat is lost from the surface of the body partly by conduction into surrounding objects in contact with it, partly by radiation into the air, but chiefly by evaporation of the sweat.

Air is a bad conductor of heat; it does not take it up readily from the body. But water is a good conductor, and so on a damp day, when the air is heavily charged with moisture, the water in the atmosphere would abstract a considerable amount of heat from the naked body. When a cold object comes in contact with a warm one there is always a tendency for the two to impart to each other their respective qualities of cold and heat until they have reached the same temperature. Thus on a cold day, and particularly a damp one, there would be a great loss of heat from the exposed skin. To maintain the body temperature in such circumstances there must be either an increase in fuel in the form of food to make good the loss, or there must be a diminution of the loss of heat. Clothes are consequently worn to prevent this undue loss. By this means we insure a temperature

of air in contact with the skin which is considerably higher than that of the outside air. Besides, clothing prevents the wind from blowing over the body surface and increasing the amount of evaporation, which would lead to undue cooling.

Having outlined the reasons for wearing clothing, we come next to the question of the nature and amount.

In determining what material the garments should consist of, we have to bear in mind that the function of clothing is to prevent undue loss of heat. Therefore a substance which is a bad conductor of heat should be chosen.

Underclothing is made of wool, silk, cotton, and linen, and in deciding which of these is the best, we have to inquire into their respective properties. Silk is too expensive a material for any but the select few, so we do not consider it further.

Wool is a bad conductor of heat, i.e., it does not convey it away readily. It absorbs moisture freely, the water penetrating into the fibers and distending them. In these respects it is much superior to either cotton or linen, its power of absorption being at least double in proportion to its weight and quadruple in proportion to its surface. This absorptive power seems to vary considerably, at least as far as rapidity is concerned, depending on the quality of the wool and the way it is woven. The best quality, woven in the style for combinations, absorbs water more readily. Good flannel does not appear to take it up quite so quickly, although this is much more absorbent than the coarser wool of cheap combinations. The water evaporates slowly from wool, and so lessens any risk of a chill. The disadvantage lies in the fact that washing usually renders the fiber smaller, harder, and less absorbent owing to its shrinkage. This can be avoided by washing the garments carefully.

Both cotton and linen are good conductors of heat, especially the latter, and more particularly so when they are woven closely, as in the case of chemises. The garments readily become damp with the sweat, and cling to the body. Evaporation proceeds quickly, and is apt to produce a great deal of surface chilling. If they are so woven that their fibers inclose a considerable amount of air in the interstices of the garment, there is a much smaller loss of heat, owing to air being a bad conductor. These loosely woven garments, especially cotton, absorb moisture freely, almost as much as closely woven fabric.

We are of opinion that for this country woolen fabrics are the best all-round underclothing during the colder months. However, robust children, and those who benefit by a daily cold bath all the year round, may possibly find cotton or linen mesh garments quite satisfactory, but we do not think they should ever be worn by delicate children, those with poor circulation, or those with neurotic or rheumatic constitutions.

In summer, if wool is worn, the garment should be very thin, but we regard cotton or linen mesh garments as probably more suitable; for they permit of freer evaporation of sweat, which is often necessary in the hot weather, and woolen material in such cases tends to prevent a sufficient loss of heat owing to evaporation taking place less readily.

The amount should be sufficient to prevent any undue sensation of cold. This will vary with the state of the weather, and also with the physique of the individual child.

Robust children may possibly suffer no harm from wearing little clothing, but the idea that you can harden a child by accustoming him from early days to wear an inadequate amount of clothing, is as erroneous as it is often calamitous. We wish to emphasize this point. Where children can with immunity stand the vagaries of our climate with less than the average amount of clothing, they do so because they are robust, not because they have been hardened to it.

All clothes should be loose. There should be no tight armholes, neck-bands, or tight elastic round the knickers. Red Riding Hood cloaks and similar garments should be particularly avoided, as their weight drags on the neck too much.

Undue tightness around the hips, thighs, and between the limbs should at all times be avoided, so that the circulation of blood will be equal to all parts of the body, and thus prevent irritation of these parts, which causes the majority of vile practices that some children acquire.

Stockings.—These should conform to the shape of the foot and not be pointed. They should be neither too big nor too small. Too many darns often give rise to sore feet. Suspenders should be used to support them instead of garters, as the latter tend to constrict the circulation.

Shoes.—These should have thick soles. The heels should not be high or tapering, but low and broad. The shape should con-

form to that of the natural foot, being wide at the toes and having the inner edge straight or slightly curved inward. The upper leather should be soft and pliable. Shoes should not be too heavy. There should be separate shoes of a lighter make for indoors. It is advisable to have two pairs of outdoor shoes in constant use, in case one pair gets damp.

Gloves.—These should be woolen and not tight. Kid gloves are inadvisable.

Hats.—It is bad to wear heavy hats. In summer they should have broad brims to shield from the glare of the sun and to protect the back of the neck. It is important to avoid tight elastic. For boys, a cap in winter and a straw hat in summer are the only kinds suitable.

Mackintoshes are not suitable because they prevent evaporation of the sweat. Coats made of rainproof material should be used instead.

Night-clothes.—None of the same clothes should be worn day and night. In winter, a flannel nightgown, sleeping-suit, or pajamas should be worn. Young children in addition should wear a woolen vest, because they so often throw the clothes off. In summer, a cotton nightgown with a vest underneath, or thin pajamas.

Bedroom slippers and a dressing-gown should be handy in case they are required. This prevents any risk of a chill.

REST

Every form of life exhibits periods of repose alternating with times of activity. Rest is a necessity to enable the organism to recuperate from the energy expended in work. In the young the active spell is only a short one and must be succeeded by a state of passivity. Thus children require frequent opportunities of rest during the day. The younger the child, the more often does it require a time of repose. By rest we do not necessarily mean only inactivity. Change of occupation may enable one part of the body to obtain quiet while another is being used. After a lesson in arithmetic, in which the brain has been very active, the performance of physical exercise, though not constituting rest in the every-day acceptation of the term, really gives repose to the brain by changing the attention to something else.

Young children are not able to maintain much attention to any subject after about twenty minutes. They require a change of occupation, and thus all lessons for little children have to be short. As the child becomes older, the capacity for concentration on a subject becomes greater, but forty minutes is about the longest time that should be devoted to any lesson.

At night-time the whole of the body seeks repose and it takes up the recumbent position. This relieves most of the muscles and gives the heart less work to do.

In sleep, the brain becomes relatively anemic and inactive, the heart is slowed, the blood-pressure falls, and the breathing becomes shallower. There are variations in the soundness of sleep, not only in different individuals, but also in each person during the night. Experiments carried out show that for normal people sleep becomes deepest at the end of the first hour, when it is dreamless; at the end of the second hour it has become shallower; from this time onward until the fourth hour it gets deeper again. After which it becomes lighter till the person wakes up. Dreaming takes place during the periods when sleep is shallower, for then the brain is more active. This is the normal curve of sleep, but variations are met with in certain circumstances. As a result of overstudy, the period when sleep is soundest may be delayed till the second or third hour; while in consequence of dietetic errors, especially in children, the first deep sleep rapidly gives place to shallow sleep and dreaming. This is particularly the case in high-strung children and explains why it is so common to get night terrors developing in the early part of the night. The amount of sleep required varies much, according to the age and also the disposition and temperament of the child. Still, one may lay down certain rules which it is advisable to pay attention to, as shown in the following table:

AGE	NUMBER OF HOURS	TIME
Under 6 years	13	6 P.M. to 7 A.M.
" 7 "	12½	6.30 P.M. to 7 A.M.
" 8 "	12	7 P.M. to 7 A.M.
" 9 "	11½	7.30 P.M. to 7 A.M.
" 10 "	11	8 P.M. to 7 A.M.
" 13 "	10½	8.30 P.M. to 7 A.M.
" 15 "	10	9 P.M. to 7 A.M.

Extend in winter to 7.30 A.M.

This is a counsel of perfection which probably few in this strenuous world are likely to attain to, especially in the later years. Most authorities, however, are agreed that from thirteen to sixteen years there should be a minimum of nine hours in summer and nine and a half hours in winter.

The child ought to be trained from his earliest days to go to sleep in the dark without anyone being present; but if he is of such a high-strung temperament that the darkness terrifies him, only harm can come from attempting to enforce such a regulation. For such children there should always be a night-light.

For some time before the child goes to bed there should be a preparation for repose by the avoidance of any form of excitement. There is a much greater likelihood of his falling quickly into a tranquil sleep if such is observed. In this connection we would point out that the activity of the brain which results from the doing of home-work up to late hours is a common cause of sleeplessness. Especially is this the case with arithmetic and similar subjects, so that, if these are set, they should be done early in the evening, leaving the lighter tasks for the last. It is desirable that an interval for light recreation should precede the retirement, in the case of all who use their brain much at night-time.

Sleeplessness is a cause of much trouble. It may often be removed by such simple remedies as a hot bath, a drink of hot milk, or the warming of the bed by means of a hot-water bottle. Many children suffer from cold feet, and nothing is more calculated to keep a child awake and restless than this. In such cases bed-socks should be worn, and a hot-water bottle used if necessary.

It is a wise plan in the older child to try and develop the power of complete muscular relaxation. It is a habit which ought to be acquired by everyone. If carried out, it would prevent a great deal of the nervous overstrain so characteristic of the day.

Ordinarily, when anyone is standing or sitting, a large number of muscles in the body are more or less on the strain, which means that nervous impulses are going down to them to maintain them in this attitude; so that, if one can relax these muscles, there is so much less nervous energy used up. In order to carry out this plan a person should lean backward in a comfortable chair or sofa, and try to let the limbs become quite flaccid, so

that, should they be moved, on being let go they would immediately fall like a dead-weight. This condition of relaxation can readily be acquired by perseverance. The effect is very recuperating.

In order to insure sound sleep, a quiet room is preferable, although most people can soon become accustomed to sleeping with a noise going on. The room should be plainly furnished, and should contain a minimum of furniture. Most bedrooms are apt to be crowded with furniture and trimmings. These very materially diminish the cubic air-space available. The wall-paper should be light, and free from any aggressive coloring. The mattress should be firm, preferably of horsehair. A feather bed should never be allowed. The pillow should be low. The bed-clothes should be ample but not excessive; to a certain extent the amount varies with the individual child, some requiring more coverings than others.

There should be plenty of fresh air, and to obtain this it is most important to have the windows open. Many people think it sufficient if the door is left open, but the air which enters thus is not fresh; it is usually drawn from the downstairs rooms, where it has been previously vitiated. Opening the window about one inch is not enough. There is absolutely no reason why the window should not be drawn down for a foot or more. The important point to bear in mind is that a direct draft on the child should be avoided. This can usually be arranged by changing the position of the bed or fixing up a screen.

EXERCISE

The question of exercise is almost as important as that of sleep. Both are necessary to the healthy child; in fact, one succeeds the other automatically. Exercise is the expression of the vitality of the child, and it is as natural for the young to run, jump, or shout as it is to require rest. The exuberance of the child's nature shows itself in this way. A child who does not exhibit this energy is usually ill. Now this being the case, it is extremely important for the fact to be recognized in school. There is not sufficient opportunity for a free display of animal spirits during the school work. Every lesson should be succeeded by a short period of play or physical exercise. We feel sure that better

results would be obtained in school work if more attention were paid to this matter. As a matter of practical experience, in some schools in Switzerland, which have adopted such a system, increased attention and energy has been the result.

Exercises may be regarded from two points of view: (*a*) educational, (*b*) physical. In the case of the former the object to be attained is so to develop the mind and brain that the scholar is more alert and quick to respond to directions, better able to concentrate his attention and control his actions, and more resolute in his demeanor. In the case of the latter the exercises are directed toward promoting physical well-being by enlarging the capacity of the chest, stimulating the respiration and circulation, and thus improving the nutrition of the body besides increasing the tone of the muscles.

They may be directed toward maintaining a healthy condition of the body, or they may aim at the correction of some deformity. Any kind of exercise which brings into play the contraction of a number of muscles produces this "nutritive" action. Thus, walking, running, jumping, or skipping all have this effect. All these movements are automatic to the child, although at the start they had to be learned by degrees. To be of educational value there must always be something new to learn, some new way of doing a thing which keeps the mind alert and active until it has been learned, when the action becomes again largely automatic. These actions may be made educative by showing the correct way of getting the best results with the least expenditure of energy; many children do not know how to run properly, but can be trained to do so. Where exercises are required as interludes between lessons, they should be such as do not require much concentration, just enough to perform them properly. Thus they should consist of simple exercises, bringing into play as large a number of muscles as possible.

In correcting deformities of the body, the quality of the contraction of the muscles has a much more beneficial effect than the quantity. The child should put his whole soul into the task, for it is imperative in this case that the mind be on the alert to insure the maintenance of a correct posture, and the concentration required to perform duties thoroughly hastens the disappearance of the defect.

To be of real value the exercises should be carried out daily.

It is important to note that at the commencement the child should be in a correct position, otherwise exercises may tend to accentuate any deformity.

Every encouragement should be given to the adoption of games. Thus, in girls' schools, such games as net-ball, tennis, or hockey should be adopted. Boys in addition should have football, baseball, etc., wherever possible. Swimming is an excellent form of exercise, for it brings into play nearly all the muscles of the body. We would only point out that many children are not able to stay in the water long enough to enable them to gain much benefit from this particular form of exercise. Especially is this the case where the water is not warm. Rowing also exercises a large number of muscles, and is to be commended for older boys and girls.

It is important in connection with hard games like football and tennis to remember that young boys and girls are not able to play them for any length of time, as their muscular energy is soon used up, and it is bad for them to try to play after they are fatigued. Older children are able by training to increase their staying power considerably. Children under twelve or thirteen cannot be trained like older boys either for athletic sports or severe gymnastic exercises. Football, athletic contests, etc., do not meet the requirements of young children. Football soon exhausts them, and is too violent while it lasts to be of permanent advantage. The same objection applies to all forms of violent exercise in the gymnasium or elsewhere; hence small children enjoy playing games, and are more benefited by them than by athletics or gymnastics with apparatus. There are, however, many gymnastic exercises with light dumb-bells, bars, and clubs suitable for young children of both sexes, and they are frequently taught in schools.

Scouting is a very popular form, in which much beneficial exercise may be obtained. But it is unsuitable for young children, and as carried out is very bad for the older boys, owing to the long marches, etc., which are undertaken. It is unfortunate that scoutmasters often set the pace according to the capacity of the bigger and more robust boys, with the result that the weaker boys suffer harm. Long marches are not good for boys, and tend to induce a dilatation of the heart owing to muscular fatigue. We feel quite sure that much better results would arise

from this enterprise if there were separate sections for younger and older boys.

Gymnastics have a tendency unduly to exercise the arms as compared with the legs. For the robuster boys it is an excellent means of training, but requires to be supplemented by games of some sort. Dancing is a form of exercise which is eminently suitable for girls. It produces a grace of movement which is obtained by no other form of physical training. All children should receive lessons in this subject, for it brings into play most of the muscles, and creates a suppleness of movement which is eminently desirable. The recrudescence of the old folk-dances has done much to popularize this form of physical education.

For very young children kindergarten games and dancing are the chief forms of exercise which should be considered. These should be so arranged that as many muscles as possible are brought into action. Set exercises in the form of Swedish or any other form of drill should not be permitted in infants' departments. The only form of exercises allowed should be marching and breathing exercises. Carried out to the rhythm of music, these exercises are made less tedious to the young child.

It is important to observe certain rules with regard to exercise. The clothing should not be so tight as to restrict the movements of the limbs or chest. A short time should elapse after a meal before carrying out any of the more active exercises. It is preferable that they should be carried on out of doors. When heated after exertion, care should be taken to avoid a chill.

Exemptions from Physical Exercises.—All children are not able to carry out or derive benefit from drill or games, etc. Some should only take part in certain of the exercises. If a child who is not over-robust has a long walk to school, he has already had a great deal of leg movements, and consequently his drill should consist mostly of arm movements and breathing properly. Children who suffer from heart disease usually find a full drill too trying. In many of these cases it may be necessary to interdict all forms of drill or games, at any rate for the time being. But sometimes it is only necessary to curtail some of the more violent or exhausting movements, such as lunging or arms-upward stretch. The same holds true in

marked cases of anemia. Slighter degrees of anemia derive much benefit from a mitigated form of drill.

All children convalescing from illness should have the exercises restricted to the simplest and those most easily performed. They should not be subjected to much strain until they have regained some of their former vigor.

Malnutrition, especially if it is due to insufficiency of food or disease, is another condition which should entail a very easy lesson, and possibly in some cases a stoppage of exercises altogether. It is useless trying to increase the capacity of the body for food if there is not enough to supply what is already needed.

Where a child has hernia, there should be no form of exercise which entails a strain on the abdominal muscles. This also applies to children who have had an abdominal operation, and should last until the scar has become much firmer, about a year after the operation.

CLIMATE

Under this heading we propose to make a few remarks on the subject of health from the point of view of the effect of climate conditions upon it.

Climate is a comprehensive term which embraces a number of different factors. All these together produce a certain "atmosphere," which we term the climate of a place. To understand something of the effect of climate we must have some idea of the various conditions comprising that state.

In taking into consideration the climate of a place, then, we pay regard in the first place to its exposure: whether it is exposed to or protected from the cold winds, whether it is open to or hidden from the sun, and whether there is an extensive area of water in the neighborhood. There is also the elevation of a place to be considered, its height above sea-level; for the higher the altitude the purer the air, the less its density and moisture, and the greater the daily ranges of temperature. These conditions produce a general stimulation of the whole body, the pulse and respiration are quicker, the body more active, and the faculties keener.

The subsoil too plays its part, for where water is stagnant whether because the place is low-lying or there is an imperme-

able layer of soil such as clay which prevents its draining away, there is a dampness about the atmosphere which has a chilling effect in the colder weather.

Other factors included under the term meteorology also play a considerable part. Meteorology is the science of the weather, and includes the amount of sunshine, rainfall, wind, temperature, and humidity. The sun warms the earth and this warms the air. It also purifies the air, because its rays have a germicidal action. It stimulates the skin and generally promotes the well-being of the body, partly through its physical and partly through its psychical effect.

Wind is movement of the air. It is produced because warm air always rises and cold air rushes in to take its place.

Humidity is the amount of moisture in the air. Absolute humidity is the total weight of water vapor in a certain volume of air. Relative humidity is the percentage of moisture in the air compared to what there would be if it were saturated. The most agreeable amount of relative humidity is 70 to 80 per cent. If this is less, more aqueous vapor is taken up from our bodies. If the amount is high, there is an insufficient removal of vapor from our bodies. This explains the oppressive feeling which we experience on a damp, hot day.

Where the relative humidity is high, it means that there is a comparatively larger amount of moisture in the air and this tends to prevent heat escaping from the earth. It thus serves to make the temperature more equable. When the temperature falls, the air soon becomes saturated with moisture, for the colder the air, the less moisture can it contain. Thus, mists develop readily where humidity is high. Where it is low, there is less tendency to fog and there are considerable variations in temperature.

Temperature is the amount of heat which the air contains. It varies with and is dependent on most of the other factors mentioned. None of these factors are independent. They each, to a certain extent, exercise an influence on the others. Speaking generally, one may say that a low-lying place, a sheltered spot, or a place where the humidity is high and there is little liability to extremes in temperature, will have a sedative or, as it is often termed, relaxing effect on the system. On the other hand, an elevated spot, an exposed place, or one that is dry and in con-

sequence subject to great variations in temperature, will exercise a bracing or stimulating action.

The physiological effects on the body produced by these differences in climate vary accordingly. Thus a bracing climate stimulates the functions of all the organs of the body, the appetite is sharpened, the circulation is quickened, the mind and body become more energetic, and the whole process between the intake of food and the output of energy is increased.

A relaxing climate produces the opposite effect. There is a relative inertia of mind and body, the appetite is lessened, and the whole process of metabolism diminished.

Now these tonic and sedative effects of climate have an important practical bearing on the welfare of child life, more particularly where the child is suffering from some indefinite ailment.

Some children are sluggish in temperament; some are rather anemic; some are convalescing from an illness; others may have that constitution which is spoken of as "having a tendency to consumption." These lethargic individuals want energizing. Their vitality is low and requires rousing. They have been meandering through life and want speeding up. A tonic, bracing climate is just what they need, and by going to one for a month or so they are driven at higher pressure and improve accordingly.

On the other hand, there are numbers of children who are excitable, hysterical, perhaps epileptic, and others with heart disease. In these there is too much wear and tear, and the machine should go slow. They need, for the time being at any rate, a more somnolent existence, and so a sedative climate with its quietening influence should be sought for them.

In connection with the annual vacation, these facts should be borne in mind: where people live in relaxing places, they should get away to a bracing air, so that their whole organism may be driven at greater pressure and they may become enlivened and toned up. On the other hand, those who live in a stimulating climate should seek a change to a sleepy place, so that they may have a rest from their excessive energy. They should do this rather than seek a still more bracing climate. On their return they will get the stimulating effect and feel all the better for the slower pace.

These remarks apply particularly to children.

A consideration of the foregoing statements in reference to individual children may enable parents, by timely change of air, to prevent a good deal of ill health or disease from arising or progressing.

SPECIAL HYGIENE

NOSE

The nose, besides being an organ for perceiving sensations which we term smell, acts as a filter for catching dust and germs, and thus prevents them from entering into the lungs. It also permits of the air being warmed and moistened before its entry into the lower respiratory apparatus.

In consequence of these functions, it will be realized how important it is for the child at a very early age to learn how to breathe properly, in and out through the nose. He should also be taught how to blow his nose and thus keep the passages fairly clear. He should never be allowed to poke his finger up or pick at his nose, in case of injuring the delicate membranous lining.

The frequency of obstruction to free breathing through the nose is so marked nowadays, and the consequences may prove so deleterious to the child's welfare, that the necessity for paying attention to such a matter must be apparent to every one. This difficulty in nasal breathing may be due to a variety of different causes, such as post-nasal adenoids, chronic catarrh, enlargement of the bones in the nose, etc. The object is to try to prevent these conditions arising, and much may be done with this end in view.

Adenoids.—This is one of the commonest causes of obstruction to breathing, and is one which is very amenable to treatment, especially in the early stages. The condition may be the cause of so much suffering to the child through causing deafness and stupidity, besides diseases of the ear, that it is particularly desirable to aim at preventing its development, and if it is present, hastening its removal.

At the outset, it is as well to state that "adenoids" is merely a term used to describe an overgrowth of a tissue which is normally present in every child. This substance is found at the back part of the mouth, just behind the nose. To prevent its

overgrowth, the early adoption of a correct method of breathing is essential, as the constant passage of air to and fro over the mucous membrane prevents its increase. This proper breathing also diminishes the risk of the child's catching cold and so developing catarrh of the nose. The irritation produced by the discharge from a chronic cold in the head is not an uncommon cause of the development of adenoids. Thus every care should be taken to avoid a cold, and so attention to the clothing and diet is of importance. The early development of sufficient mastication also becomes of moment in this connection, because a neglect of this tends to the development of a high, arched, narrow palate; this in turn leads to a certain amount of nasal obstruction, and in consequence there is a greater tendency for adenoids to arise.

We feel absolutely sure, from the experience of hundreds of children with adenoids, that in the majority of cases the condition could be prevented by the simple exercises which are given, providing it is not a case of long standing, which is then termed chronic, when the advice of a physician and a minor surgical operation are necessary.

These exercises should be carried out under the supervision of some older person, to insure their being properly performed. They should take place at home, preferably in the open air, as well as at school. A few minutes devoted to these exercises three times a day will produce striking results, where they are carried out properly. The child should stand firmly on his legs with the shoulders well back and the mouth firmly shut. First, the right nostril should be closed with the finger, then a deep breath should be taken through the left nostril, and the expiration should also come down the same channel. This process should be repeated several times, after which the sides should be reversed. Finally, both nostrils should be kept open and the same proceeding carried out.

Chronic Discharge.—This may be just a thin, watery secretion, or it may be thicker, and sometimes is purulent and offensive. The discharge may be due to a variety of causes: the presence of a foreign body, such as a pea, or ulceration, etc. It is advisable at an early stage in a persistent trouble like this, to obtain further advice from a doctor, as neglect of this may lead to more serious developments later on.

MOUTH

Probably there is no trouble which is more common than an unclean mouth. This may show itself by the presence of little ulcers on the inside of the cheeks or elsewhere. These usually occur in unhealthy, underfed children, and one of the first aids to their removal is to improve the general tone of the child by feeding up, etc. The use of an antiseptic mouth-wash tends to hasten the cure.

The prevailing disease of to-day is pyorrhea, or Riggs's disease, commonly called "receding, bleeding, or spongy gums." It is caused by food collecting and decaying between the teeth, and at the juncture of the tooth and gum. The soft food becomes dry and hard, forming deposits and pus-sacs which are infiltrated with pus. The gums are receded on the teeth, soft, spongy, and bleed with the least touch, and the breath is very foul and offensive. They are dull and bluish-red in color, with an elevated inflamed area around each tooth affected. This condition is serious and requires the services of a dentist at once, to remove the hardened deposits and let out the pus, which is being absorbed into the system, thereby weakening it and causing other diseases.

Teeth.—There is no disease which is so universal as, or which causes more ill health than, decay of the teeth. The condition is produced in the first place by the accumulation of starchy food in the crevices and irregularities of the teeth. This accumulation, through the action of germs, undergoes an acid fermentation. In course of time this acid dissolves out the lime salts from the teeth and leaves a soft gelatinous structure behind, which acts as an excellent bed for the growth of the germs. This process gradually continues until the tooth is eaten through and the decay reaches the dental pulp, whence it spreads rapidly into the underlying gum substance and eventually results in the development of an abscess in the gum. This is a brief description of the history of decay in a tooth. It may take a longer or shorter time, depending on the strength of the teeth and the quality of the enamel.

When one considers the enormous amount of dental decay which exists among children at the present time, and the fact

that among primitive races and in ancient man the teeth were in a remarkably healthy condition, one cannot fail but derive the conclusion that the causes of this disease are to be found in the conditions of civilized life. The quality and character of the food is the chief condition which determines this difference. The diet of primitive man consisted largely of animal or vegetable food in a more or less coarse condition, with plenty of fiber and toughness, requiring a considerable amount of mastication before it could be swallowed. This coarse food kept any starchy particles from remaining in contact with the teeth. Present-day cooking has as one of its objects the elimination of toughness from meat and fiber from vegetable foods, with the result that there is little in the food to act as a cleanser, and what little there is is quickly hurried on, owing to the ease with which it can be swallowed.

This subject is further considered in the section on Diet.

Wild animals do not suffer from dental caries, nor do domestic pets when they are allowed to gnaw, but those which are fed on soft food only, do develop decay.

Most children at the outset have a good set of teeth, and if their diet is modified somewhat from the usually accepted standards, they are starting on the right way to prevent decay arising. Thus no meal should finish up with soft food like white bread or puddings; there should always be something harder to chew, like a dry crust or a raw apple. Finally the mouth should be rinsed with water.

The use of a tooth-brush in addition is an added precaution. The brush should have fairly stiff bristles, preferably cut to the contour of the teeth. The teeth should be cleansed after every meal, and particularly at night-time after supper, for most harm is done when food remains in contact with the teeth all night.

The edges and crowns of the teeth should receive attention as well as the sides, both inside and outside. The brush should pass from the gum toward the edge of the teeth with a rotatory action, to facilitate removal of particles from between the teeth. A bland powder like precipitated chalk may be used, but is not necessary. It is important that a gritty powder be not used, as it tends to wear off the enamel.

More fibrous food is important, because it necessitates mastica-

tion before it can be swallowed, and thus not only prevents decay, but increases the size of the jaw and the strength of the teeth. The increase in the size of the jaw also prevents the crowding of the permanent teeth, and in this way too there is an improvement.

There has been a great outcry against the use of sweets, as being particularly harmful in causing dental caries. There is no doubt that they may be a fertile cause of this condition, particularly the soft sticky kinds, but if precautions are taken to chew some cleansing agent afterward, there is no occasion to deprive children of what is a natural craving for sugar in this particularly palatable form.

The use of an antiseptic dentifrice is an excellent thing as a toilet requisite, but it has little effect in reducing the multitude of germs which inhabit the mouth.

In the prevention of dental disease, then, there are three main lines of defensive action:

1. The adoption of a proper diet from the earliest age, this demanding the practice of mastication.
2. Cleanliness in the form of washing out the mouth and brushing the teeth.
3. The systematic inspection of the teeth by a competent dentist, and the early treatment of decay.

The first two aim directly at preventing disease arising; the last acts indirectly in this way, by getting at the teeth in the earliest stage of the decay and filling them, so that the disease ceases to spread.

The teeth should be examined at least once a year. It is particularly important that this should be done regularly from the age of six years, when the permanent teeth usually begin to emerge.

THROAT

Enlarged tonsils are extremely common in children, and although in the majority of cases they give rise to little or no inconvenience, there is always the fact that they are potential sources of trouble. It is commonly regarded nowadays that they are the seat of entry of many diseases, such as scarlet fever, rheumatic fever, etc.

One of the causes of this enlargement is undoubtedly the pres-

ence of a number of decayed teeth. Mouth breathing is another, also frequent colds.

The line of prevention is obvious. To keep the throat healthy the child should have a clean mouth and a clean nose.

The tonsils are often the seat of inflammatory processes, which may result in the formation of an abscess. An unhealthy condition of the tonsils is one of the causes which prevents a discharging ear from healing.

Where a child is constantly having sore throat it is advisable to seek medical advice for the condition.

EAR

Not only may a child suffer physically from a diseased ear, but the interference with hearing, which so commonly ensues, causes the child to lead a hampered life. He is unable to appreciate the finer degrees of sound, and if the defect is more marked there is a stunting of intellect. Consequently the maintenance of a healthy condition of this organ is of great importance in considering the child's welfare.

The ear is an external appendage which enables sound to be collected more easily and transmitted down the auditory canal to the drum. The walls of this canal contain certain glands which secrete a sticky substance called wax. This is for the purpose of preventing dust or other foreign matter from penetrating to the drum. Often there is a tendency for this wax to accumulate to such an extent that with the extraneous matter it forms a hard pellet, which may press on the drum and thus give rise to pain or cause deafness. This should be removed, but it must first be softened by the instillation of a few drops of warmed sweet oil or glycerine and water a night or two previous to syringing with warm water. Great care is necessary in syringing the ear to avoid damaging the drum.

The wax should never be removed from a child's ear by means of a pin or hairpin, as is so often done, as the drum may be easily injured thereby.

The wax is a normal secretion, which is there for a definite purpose, and it is unnecessary to remove it unless it becomes caked. In fact, the continual removal may be attended with unfortunate results in these days of motors with so much fine dust

raised. Only that which can be easily reached with a towel after washing should be removed. It is not an uncommon thing for young children to put things in their ears, such as beads, buttons, or peas. It is always advisable in such cases to obtain medical advice, as an awkward attempt at removal may result in permanent damage to the drum. In the case of peas or beans a syringe should never be used, for if the foreign body is not removed it swells up with the moisture and becomes more impacted than ever.

Care should be taken when bathing to wear a plug of cotton in the ear, as the water is often highly polluted, and this precaution will, to a certain extent, prevent the germ-laden water from coming too closely in contact with the delicate membrane of the drum.

A discharge from the ear is a common complaint in childhood. The fluid may be thin and watery, and this is often associated with a cold in the head. This condition usually gets well with the disappearance of the cold. It requires careful watching, however, because inflammation may develop and be the starting-point of a chronic ear discharge. These purulent discharges are usually the sequel to some infectious disease, such as scarlet fever, measles, or whooping-cough. The condition spreads from the unhealthy state of the nose and throat, along the tube which leads up to the ear from this region. Chronic discharging ears should always be regarded as serious affections, as not only may the health of the child be impaired by the constant presence of a septic focus, but there is usually more or less deafness, and there is always the potential danger of an abscess developing either in the bone behind the ear or in the brain. One cannot too strongly emphasize the importance of early and active treatment in such cases.

Deafness is one of the conditions which very materially hamper a child's intellectual development, especially where it is persistent. There are varying degrees of severity, and many causes contribute to the defect, such as the pressure of wax, a chronic ear discharge, adenoids, etc. The hearing is usually tested by means of a loud whisper at a distance of twenty feet. Any child who cannot hear thus is deaf, the degree depending on the distance at which he hears the sounds.

Probably most cases of deafness in children are remediable,

especially if they are taken early enough; consequently, where it is discovered that a child is persistently deaf, even though only slightly, it is advisable to seek the opinion of a competent judge on the question, instead of waiting indefinitely in the hope that as the child grows older he will get better. This waiting may mean that the chance of treatment in a favorable stage of the condition has been lost, and in consequence the result of the treatment may not be so good.

Where it is found to be impossible to remedy very defective hearing, instruction in a special school is necessary to enable the child to make any progress and become a useful member of society.

EYE

The eye is a complex optical apparatus, more or less comparable to a camera. It is a comparatively globular organ, consisting of a series of media which bend the rays of light coming from an image so that they meet at a point on the retina. From this the impressions pass to the brain, where they are interpreted into the picture that we see. The most important of these media are: the lens, which is situated within the eye and has a convex shape, which can be altered by the contraction of a little muscle called the ciliary muscle; and the cornea, which is the curved outer surface of the eyeball and is situated in front of the pupil.

At birth the apparatus is defective, because in the first place a clear image is not produced owing to the length of the eyeball being relatively much less than that of the adult. Also the retina is not sufficiently well developed to appreciate variations in the amount of light, and the brain is still too immature to interpret the sensations. As the age of the infant advances, each of these factors improves, more particularly the last two; but the shape of the eyeball changes slowly, and even by the age of six or seven years it is still often too short, as compared with the adult eye.

In considering vision we differentiate between what is called distant and near vision. Distant vision refers to the appreciation of objects at a distance of twenty feet or more. When the object is within twenty feet it is termed near vision, but practically this term refers to the reading distance. This distance, viz., twenty feet, is selected because for practical purposes all

rays of light coming from objects as far from the eye as this are parallel. If the object is less than twenty feet away, the rays of light, instead of being parallel, are divergent before they reach the eye.

In the normal or emmetropic eye, the parallel rays from the distant object are brought to a focus from the retina with the eye at rest—that is to say, without any effort of accommodation being made. But when objects are closer than twenty feet, in order to bend the rays to form a clear image the process of accommodation has to take place. This process consists in the contraction of the ciliary muscle whereby the lens is rendered more convex. The result of this is that the diverging rays are bent more and brought to a point on the retina. If this process had not taken place, the rays would not have been bent sufficiently to bring about a clear image on the retina, but would have been brought to a focus at an imaginary point behind the retina and thus the image would have been indistinct.

In the hypermetropic eye, which is that commonly called long-sighted, the eyeball is shortened from before backward and the focus of parallel rays of light is behind the retina. This is the kind which is found in all young children. Parallel rays coming from a distant object would be brought to a focus at a point behind the retina unless the ciliary muscles were contracted. If the object looked at were within twenty feet, the muscle of accommodation would have to contract still more to enable a clear image to be pictured on the retina; and the nearer the object, the greater the degree of contraction of the muscle, this increasing in greater ratio than the diminution of the distance, so that this little muscle is working all day long, for it has to contract to enable a person to see both distant and near objects. It is not surprising, then, that it gets fatigued easily, especially after close work, when of course it has to work harder. The result is that the person experiences a sense of heaviness about the eyes, the words or stitches become indistinct, a headache comes on, and no sense of relief is felt until there is a complete rest for the eyes.

Now, by placing a convex lens in front of the eye you can so bend the rays of light coming from an object that they will come to a clear focus on the retina without requiring any effort of accommodation. This practically brings about the same result

as is found in the normal eye, where accommodation is required only for near objects. This is the reason why glasses are prescribed in such cases. If the above explanation has been grasped, it must be obvious that in young children the frequent use of the eyes for near work must mean that the muscles of accommodation have to be worked hard and constantly. In consequence fatigue soon ensues, for it must be remembered that in children nerve-centers get exhausted much more readily than in adults. Usually in such cases the object is brought nearer to the eyes. This produces a larger image, though not a clear one, and, in addition, the object appears brighter because it is nearer.

The practical bearing of all this is that any form of minute work should be rigorously excluded from the infants' school. Thus children up to the age of six to seven years should not attempt to read print out of a book. They should not write in books or on slates. They should, above all, do no sewing, and knitting is better left until a later age. They should learn their letters or sounds and words from large printed characters on a wall-sheet or blackboard. These letters should be thick and about six inches long, and either white on a black background or vice versa. Instead of writing they should draw letters, etc., in sand, or make them with sticks, or print large letters on the blackboard, moving the whole arm freely for the purpose, and not attempting any of the finer movements of the fingers. As a general rule, about the age of seven years the eye has practically grown to its full size, and there is not the same imperative need to eschew all forms of close work.

When it is considered that some twenty per cent. of school-children suffer from a greater or less degree of defective vision, it becomes certain that school work as at present carried out is having a prejudicial effect on the eyesight. There are many factors at work in schools tending to produce these defects, and most of them can be remedied. The question of efficient lighting in this connection is of great importance, because a well illuminated object is seen with much less strain than one which is badly lighted. Much harm is done at home by reading and doing other close work in a dim light.

All materials used should be of striking contrast, so that there is great definition of the objects illustrated. Where ink is used it should be a decided black and not a watery imitation. Copy-

books should have their lines distinctly marked; the custom of faint ruling is to be deprecated. The paper of books should not be glazed, as this causes much strain from the glare produced. The paper should not be so thin that the printing on the other side shows through. The printing should be bold and distinct. Legibility depends mainly on the height and breadth of the short letters, for the larger the type the farther from the eye can it be read with ease; and it is of the first importance to induce the young reader to keep a sufficient distance between eyes and book. Children under seven should be able to lean back in their seats and read from the book propped up on the far side of the desk.

This is the proper size of type for children of various ages to use:

A child's eyesight
From 7 to 8 years.

A child's eyesight will
From 8 to 9 years.

A child's eyesight will be
From 9 to 12 years.

A child's eyesight will be tested
From 12 to 15 years.

A child's eyesight will be tested free of
Over 15 years.

No child should ever work or read at a closer distance than from ten to twelve inches from the eyes. If children habitually work within this distance, they should be taken to a doctor to have their eyes examined.

Defective vision may be due to many different causes, of which those that concern us are:

(*a*) **Opacities on the Cornea.**—These are usually the scars resulting from an ulcer on the surface of the eyeball. Little can be done to improve this condition. It should be attended to at the earlier stage, when the eye is inflamed. If prompt and adequate treatment is obtained, then the risk of a scar remaining is very much less. Neglect in the early stage means that the ulcer gets deeper and a scar must be the outcome after healing.

(*b*) **Defects in the Shape of the Eye.**—These may be simple or complex, and roughly are classified as myopia, or short-sightedness, hypermetropia, or long-sightedness, and astigmatism. In this last condition the curve of the eye in one plane is different from that in another. There are many varieties of this last kind of defect.

Myopia is not so common as the others, at any rate in this country, but it is sometimes a very serious defect because of a tendency for the condition to become more marked. It is associated with school life and seems in many cases to be due to school work; at any rate, it is much aggravated thereby, consequently it is best for those who have a comparatively high degree of defect to avoid much study. Children with marked myopia cannot be taught in an ordinary school without harm arising. They require separate tuition with special desks and no books. Ordinary work aggravates their condition.

Hypermetropia has already been considered.

Astigmatism is one of the commonest causes of headaches, some of the slighter degrees of this defect giving rise to considerable distress. Consequently, if a child persistently suffers from headache after using his eyes, even though he appears to see perfectly well, there may be some such slight defect and it is wisest to have the eyes tested by an oculist. We would urge here the importance of consulting an eye doctor in cases of defective vision in children, instead of consulting an optician who prescribes glasses.

THE SKIN

The skin fulfils many important functions. Not only is it a protective covering for the different organs and tissues, but it excretes waste products in the sweat and regulates the temperature of the body. It also is the seat of the appreciation of tactile sensibility, and contains the delicate nerve-endings which convey a sensation of pain whenever the skin is injured, and so enable the part to be removed from the source of injury; consequently, the importance of maintaining the skin in a healthy condition becomes very obvious.

In performing its excretory process it gives off sweat, which may dry on the body and leave the solid waste products there.

It also secretes an oily substance, which makes the surface greasy. All the time it is liable to contamination from outside dust, and this clings particularly to greasy bodies. The superficial layers of the epidermis, too, become dead and are cast off.

Owing to the accumulation of these waste matters, the pores of the skin are liable to become choked and health must suffer from the inability of the excretory products to escape freely.

The removal of all these waste products is essential to health, and so it is imperative that the skin be frequently and periodically cleansed. This is best carried out in a hot bath, as cleansing is facilitated by hot water. A daily bath is preferable and is best taken in the evening, as the warmth helps to induce a soporific effect. A weekly bath is a necessity. Care should be exercised that the child has not just finished a meal; at least half an hour should elapse, and preferably an hour.

Toilet Soap.—The choice of soap is a very important one in the case of children, as their skins are more sensitive to any source of irritation.

Soaps are formed by the combination of an alkali with fat. They are either hard or soft. In the former soda is used, and in the latter potash. Hard soaps are used for toilet purposes. They may be neutral, alkaline, or superfatted. Neutral soaps are the best to use because there is no free alkali in them. When they mix with water, the soap breaks up to a certain extent and sets free some alkali, which combines with the greasy matter on the skin and thus hastens its removal. Alkaline soaps contain an excess of alkali over that combined with the fat, and this is liable to produce irritation of the skin; consequently such soaps should not be used for toilet purposes.

Superfatted soaps have an excess of fat to make sure that there is no free alkali. The drawback to their use is that hot water is necessary to bring about a lather.

Cheap soaps are often made of rancid fats and are highly scented to disguise this. They are apt to irritate the skin and so should be avoided. Soft soap contains a good deal of alkali free, and is chiefly used for the removal of scurf from the scalp. It should not be used on the body.

Bathing.—One function of the skin which it is important to have acting properly is that whereby the blood-vessels in the skin react to the stimulus of the outside temperature and so

control the loss of heat from the body. A ready response on the part of the skin to sudden changes of temperature prevents the body from losing heat unduly, should the weather suddenly turn colder. This response varies considerably in different individuals. One of the best ways of inducing a quick response is the practice of taking a cold bath every morning. The immersion should last for a short time only, about half a minute or so. The idea underlying this treatment is that the sudden exposure to cold causes all the blood-vessels in the skin to contract and the blood is driven into the internal organs. If the person comes out at once and dries rapidly with a rough towel, there is a reaction, the blood-vessels dilating again and producing that comfortable, warm glow which is so exhilarating. If the bath lasts too long, the skin becomes blanched, and the reaction with its healthy glow does not come, but the person feels cold and shivery and looks blue. All children cannot endure this treatment. There are many for whom it would be very unsuitable, and who, if exposed to such treatment, would be subject to considerable discomfort and probably worse. A less severe method than the cold plunge is the cold sponge all over, and this may suit many children who could not stand the more drastic plan. Others who could not bear this might derive benefit from a tepid bath, and probably it would be possible gradually to make the bath colder, as the skin comes to react more readily.

There are certain diseases affecting the skin which can be to a large extent prevented by watchful care and treatment.

Urticaria, or Nettle-rash.—This is a common complaint. It manifests itself usually as a white pimple on top of a red base. The patches may be large or small, and the trouble localized or extensive. It is due to some form of poison-absorption, arising either externally or internally. As examples of external irritants, one may mention the stings of a jelly-fish or caterpillars, or of the stinging-nettle, or chemical irritants used in treating or washing clothes. Examples of internal irritants are poisons resulting from the ingestion of various forms of shellfish, mushrooms and certain fruits. Some people are peculiarly sensitive to certain articles of diet, namely, strawberries.

The presence of worms in the bowel is not an uncommon cause of this condition.

The avoidance of any of these articles of diet is the surest way of preventing the trouble arising. When it does arise, it is important to try and determine what has been the irritating cause, and by avoiding it in the future keep the condition from developing. The skin in children is very sensitive and quickly responds to any irritation. Thus, a little friction, particularly if there is any dampness about the garments, will produce an erythema, or reddening of the skin; also the juices of certain plants produce erythematous rashes. An eczematous eruption on the face, and particularly at the back of the ears, is often the result of inattention to proper drying of these parts after washing, and then going out into the wind. Cheap soaps may produce similar results, more particularly in sensitive skins, owing either to excess of alkali in the soap or to the fats composing it having become rancid. The use of a good soap will tend to prevent such a condition arising.

Some children's faces are so sensitive that soap of any kind is too irritating. In such, the use of oatmeal in a muslin bag is a useful means of cleansing where something besides plain water is required. Soft water is better than hard for washing with, and clean rain water is especially good.

Blackheads.—Many children, especially as the age of puberty is approached, are troubled a good deal with greasy skins and blackheads. These latter are the dried-up, horny part of a little plug blocking many of the ducts of the sebaceous glands. They are common on the face, chest, and back, and may give rise to considerable disfigurement through the development of pustules behind them. Much trouble and discomfort may be saved by preventing such a condition arising. The use of plenty of soap, hot water, and friction with rough towels may be quite enough, but it may be necessary to steam the face over hot water and press out the little plug by means of a special instrument called a comedo extractor. The use of a watch-key, which is commonly used for the same purpose, is to be deprecated, as it often injures the skin and sets up irritation.

Ringworm.—Another common affection is ringworm. This condition exhibits different appearances on the body from what it does on the scalp. In the former it usually consists of a more or less irregular ring consisting of raised reddish patches. On the scalp there is rarely any redness, but the condition shows

itself usually in patches of white scurf with short, broken hairs on it. It is a comparatively simple thing where it attacks the body, but the disease affecting the scalp is much more persistent and troublesome to deal with, owing to the fact that it involves the hair roots, which pass down fairly deeply into the tissues of the scalp. These conditions, even with treatment, usually last six months, but may last considerably longer than this, as many as three or four years elapsing before the condition is cured. It is consequently important that every precaution should be taken to prevent a child developing the complaint. Thus no child with ringworm should attend school and mix with other children. This applies to Sunday-school as well as day-school. Children should be cautioned about wearing each other's hats. Each child should have a certain numbered peg to hang his hat on and should keep to it. All brushes, combs, and towels should be separate for each child. A child with the disease should wear a linen cap, especially if he has to sleep with others.

Lousiness.—Pediculosis, or lousiness, is another condition affecting the skin or its appendages, which is largely cured by prevention—in other words, by constant and unremitting care. The condition is most common in the head. Some children are much more prone to suffer than others. Delicate children seem to be peculiarly susceptible. The lice may pass from one person to another through the wearing of somebody else's hat or coming into close contact with someone else's hair. They are also conveyed through the medium of public conveyances, such as street cars. They feed on the scalp and give rise to itching, which makes the child scratch and produces sores, inflamed areas, and scabs on the head.

The only way to deal with the disease is to kill or remove both lice and nits. The latter are the eggs, which are laid on and firmly cemented to the hairs.

When children are exposed to infection, the nightly use of a fine-tooth comb should be quite sufficient to keep the child free. In school, it is best to have the hair braided, as this lessens the risk of spread of infection. For the removal of nits from the hair, the following remedy is of value: One part of soft soap is mixed with three parts of boiling water and applied to the heads of the children as hot as they can stand it; it is then worked

up into a fine lather and allowed to remain on the head for ten minutes; the lather is then thoroughly removed from the hair by combing with a fine-tooth comb, which should be frequently washed in hot water during the process.

Where body lice are troublesome, the undergarments should be boiled if possible, to kill the nits, which are mostly laid in the neighborhood of the seams and pleats. Those garments which cannot be boiled should be baked in the oven.

The use of sulphur ointment rubbed on to the body occasionally is a good preventive, and likewise dusting the sheets with flowers of sulphur.

Dandruff.—One of the commonest affections of the scalp is the presence of dandruff. This may be in the dry, scaly form, or the scales may be matted down by excessive greasiness and produce a dirty brown discoloration of the scalp. Conditions like this should not be allowed to remain. The best way to prevent the trouble starting is to increase the circulation in the scalp. The hair should be well brushed for at least five minutes a day. Massage of the scalp with the finger-tips daily will so stimulate the flow of blood that the skin and hair-roots will be in a thoroughly healthy condition. The discarding of a hat will assist this.

Corns.—Corns are ingrowths of epidermis. These become hard and horny, and when pressed on to the sensitive nerve-endings by the shoe leather, produce pain. Corns are produced by the intermittent pressure which occurs when ill formed or tight-fitting shoes are worn; therefore, the wearing of broad-toed, properly shaped shoes is the most important part of the prevention of this painful trouble.

Chilblains.—This painful affliction of the hands or feet is particularly common among children with defective circulation in the extremities. Chilblains arise most commonly in cold weather. A sudden change from hot to cold water, or vice versa, may cause them to develop. Usually, the general health of the child is below par.

The steps which should be taken to prevent the condition arising are adequate and warm clothing, especially over the extremities. Thus woolen gloves should always be worn and put on before the child goes out of doors. Stockings should be woolen and there should be no garters. Warm water should be used to

wash with. The child should be encouraged to exercise freely, especially first thing in the morning. He should not sit and mope about. The diet should be ample and contain plenty of fatty food. Cod-liver oil may prove helpful.

Care of the Nails.—The nails of the child should be cut carefully with rounded ends. They should always be kept short, for not only are they less unsightly, but any risk of transference of the eggs of threadworms from the outlet of the bowel to the mouth is considerably lessened.

The skin on the nail root should always be pressed back by means of an orange-stick instead of being allowed to spread over the nail, when it so often becomes cracked and may give rise to troublesome sores.

The habit of nail-biting should be checked at once, as it renders the nails unsightly and may produce an injury by their being clipped off too close to the nail bed.

NERVOUS CHILDREN

The Causes, Character, and Health.—The temperament of children varies much, but one may recognize certain types. These types are distinct, but all children do not conform to them, for there may be intermediate grades. First, then, there is the dull, phlegmatic child, who is roused with difficulty, slow in thought, quiet in disposition, and sluggish in action. Again, there is the sunny child, whose temperament is equable, who takes life easy, readily makes friends, and is very even-tempered. Then there is the nervous, excitable child, with whom we are more particularly concerned, for it is in this type of child that the neglect of certain little points of hygienic importance may give rise to disastrous results. These nervous children are very emotional. Their brains are on a higher level than the others. It is from this class that the infant prodigies and geniuses arise, and this type is the greatest source from which the mentally unstable are drawn. There are two main groups: (*a*) those children who exhibit little or no power of self-command; and (*b*) those in whom there is great capacity for self-control.

The characteristics of those in the first group are as follows: They are usually very eager and energetic for the time being, but this feverishness soon dies down. They are restless, always

wanting to be doing something or other, but soon tiring of it and giving it up for something else, which, in turn, is cast aside. They lack the power of application. They jump at conclusions. Quick to grasp a thing, they soon forget it. They have little capacity for judgment. Usually very imaginative, they are easily frightened and petty things worry them. Easily upset, they soon become peevish. They show affection readily, but it is not always deep, and they are often selfish, volatile, and garrulous.

In appearance, they are often thin and spare of frame. Their complexion is pale or sallow, and they exhibit dark circles under the eyes. There is often a restlessness of the eyes and a fidgetiness of the fingers; also a tendency to pick or bite their nails. They wriggle about on a seat and seem to find it impossible to keep still. Their appetite is fitful and they are fanciful in their diet. Their digestion is often easily upset without apparent cause. They are prone to suffer much from functional nervous disorders.

In the second group you have a better type—those who feel keenly but do not let their feelings run away with them. They have great power of self-restraint. They are intelligent and observant, and, unlike the former type, are able to apply themselves to work without getting tired of it. In fact, they often work so hard that they overdo things. In many ways they are the reverse of those in the first group. They are imaginative, and if carried to extremes, maintain their point of view stoutly. They soon grasp an idea and retain it. They are reticent and often self-absorbed. Slow to show affection, they are tenacious in preserving it. Their judgment is usually sound. They are very sensitive and keep things to themselves. These children do not present any particular physical characteristics.

Those excitable children in the first group are peculiarly prone to suffer from various functional nervous disorders which may give rise to a great deal of distress, although many of them are of little consequence. They are chiefly of the nature of overaction or irregular or abnormal action of the nervous system. The causes which lead to the occurrence of these disorders are nearly always traceable to the inheritance of some neurotic traits. They occur in children who come of a neurotic stock and who are of an emotional type. The nervous system of these individuals

is in an unstable condition, and consequently any slight thing may be the cause of an outbreak. Thus the presence of any local irritation, whether in the form of teething, adenoids, or worms in the bowel, may give rise to convulsions or other forms of nervous disorder in the child of neurotic parentage, which would produce no effect in the child of parents with a more equable temperament. Consequently, these children require much more careful treatment than others, both at home and at school, from every point of view, in order to bring them up with the minimum amount of nervous exhaustion. We may briefly indicate some of the nervous disorders to which such children are more liable:

Habit Spasms.—These are spasmodic twitchings of certain muscles, such as constant blinking of the eyes, or the sudden jerking of the head to one side.

Night Terrors.—These are bad dreams, the child starting up screaming, though not necessarily waking up. They often occur about an hour or two after the child has gone to sleep. They are often attributed to disorders of the digestion, but the chief cause is the unstable nervous system which misinterprets the exciting cause; the obstruction to breathing caused by adenoids, or covering the face with the bedclothes, gives rise to an impending feeling of suffocation. As a rule, these paroxysms disappear as the child grows older.

Day Terrors.—This is a similar condition, but less common. It is characterized by sudden screaming and unmistakable signs of fright. The effect is produced by an auditory or visual hallucination.

Sleep-walking.—Somnambulism, or sleep-walking, is another exhibition of the same nervous instability.

All these disorders should be looked upon as danger signals, showing that the brain is being driven at too great pressure.

Nocturnal Incontinence of Urine.—Where this distressing complaint continues into childhood, it is nearly always associated with the neurotic inheritance, and in such cases may be regarded more as an example of the uncertain control which the higher nervous system has over the lower, than as any disease in itself. Such conditions may right themselves, but if not amenable to treatment, a physician should be consulted.

Chorea, or St. Vitus's Dance.—This is another condition which occurs mostly among children such as we are considering. It is

associated with rheumatism, and is, in fact, a form of rheumatism which affects the nervous system. Rheumatism is more likely to take this form in neurotic children, especially after a fright or shock of any kind; sometimes even the return to school after a slight attack of rheumatism may bring it about.

Epilepsy.—This is one of the graver diseases that occur much more frequently among nervous children than among others. It occurs in two main forms: the severe type, with loss of consciousness; and the slighter attack, which may be looked upon as a passing giddiness or absent-mindedness, etc. It arises most commonly in childhood at the periods of second dentition and puberty, and consequently any child who has had convulsions should be watched carefully at these times.

Hygiene.—As a rule it is not a difficult matter to recognize a nervous child, but it is very important to do so and to order the child's life accordingly. These children should preferably live in a sedative climate, because the air is less stimulating and there is a greater likelihood of repose. They should have great regularity in the matter of times for meals, sleep, etc. To a certain extent, their capricious appetites should be humored. The food should always be served in an appetizing form, to tempt their palate. They should be out of doors as much as possible, and, if practicable, should attend an open-air school. It is important, though, that they do not rush about too much. Adequate rest during the day is very essential, and an hour in the reclining or recumbent position at midday would prove very beneficial. They should go to bed early, and if terrified of the dark, should have a light in the room. The windows should be wide open. If necessary, the bed should be warmed. They should avoid all forms of excitement, particularly before going to bed. There should not be a heavy meal just prior to bedtime. It is better to postpone their attending school as long as possible. They should not attend as early as the average child. The amount of schooling should be determined by the state of their health. There should be no overtaxing, no home lessons, and plenty of relaxation. Parties, theaters, etc., should be avoided, and the life led should be as quiet as possible.

Attention to such points will give these children a much better chance of avoiding some of the functional disorders, etc., which we have indicated above.

BONE AND MUSCLE DEFECTS

Under this heading we propose to say a few words about the minor deformities only. They are most commonly met with among the older children, especially those who are growing rapidly as they approach puberty. Such deformities, if they are recognized in time, are usually remediable with the exercise of care and attention to little details. A short description of some of the commoner conditions may prove serviceable.

Deformities Affecting the Spine.—One of the commonest of these is that known popularly by the term "round shoulders." There are two forms of this defect: (*a*) simple round shoulders with the lower part of the back comparatively flat. This form is known as simple kyphosis, and is common in young children. The condition is usually due to faulty posture. Many cases in girls are due to the bad shape of their corsets, which are too narrow in front. This necessitates a forward movement of the shoulders to ease off the pressure on the front of the chest.

(*b*) A more marked bending of the shoulders, with a compensating arch in the small of the back, projecting the abdomen forward. This deformity is a more rigid one. It is common in older children. Flattening of the chest and deficient expansion of the lungs result from it.

These defects can be prevented by care on the part of the parent or teacher. Thus all clothing should be loose and properly shaped. A correct posture should be insisted upon, both when sitting and standing. Any conditions, such as defective sight, which make the child stoop should be corrected. Where the muscle tone is weak, there should be plain, wholesome feeding, plenty of fresh air, and proper exercises for the muscles.

Lateral curvature of the spine is also very common among children. Statistics in different countries give an average of about twenty-five per cent. of cases with some degree of the condition. The proportion seems to be about equal in boys and girls. The nature of the curve varies, but the commonest is a long one with the convexity to the left. Seventy per cent. of the cases belong to this type. These lateral curvatures may be due to an irregularity in the length of the two limbs, or may be produced by habitually standing with the weight of the body on

one leg, or by sitting with the body tilted to one side, as is often the case in writing, or by carrying heavy weights always on one side. Correct posture, general hygienic measures, and exercises for the muscles of the back ought to prevent most of these curvatures from arising.

Corrective Exercises.—Exercises which are specially suitable for preventing or removing spinal curvatures are as follows:

(*a*) Head exercises—bending backward and sideward, and turning.

(*b*) Trunk exercises—bending backward, forward, downward and sideward, and turning.

(*c*) Shoulder exercises—raising arms forward, upward, and sideward.

Deformities of the Foot.—One of the commonest of these is flatfoot. In this condition the arch has given way and the whole, or almost the whole, of the sole of the foot touches the ground. It is a condition which interferes much with the usefulness of the foot, but if taken early it is very amenable to treatment. There are various degrees of severity. In the earliest stage, the arch returns when the weight of the body is removed or the person rises on his toes. In the second stage, the muscles, etc., are weaker, and the arch cannot be regained except by manipulation. There are other degrees more marked still. To prevent the condition arising, or to cure it in its earliest manifestation, the child should practise tiptoe exercises, standing on the outer border of the foot and walking thus, resting as soon as walking or standing produces fatigue. Cycling and skipping are also very good exercises. In the second stage it is necessary to wear a specially constructed shoe, or else a metal plate inside the shoe. The major degrees we are not concerned with, except to state that neglect of the simpler deformities is likely to lead to the development of the more marked defect.

Another common deformity is that the person walks on the inner edge of the foot, and the ankle bone projects more and is nearer to the ground. The treatment is the same as for flatfoot.

Still another common deformity is the opposite defect to flatfoot. In this case the arch is excessive. A slight condition of this nature is sometimes met with in adolescent girls, and the cause has been attributed to the wearing of tight, short shoes with high heels. In other cases the defect is due to organic

diseases of the nervous system, etc. The condition is often a troublesome one, owing to the frequency with which corns develop on the soles of the feet. The wearing of thick woolen soles to the stockings tends to lessen the likelihood of their appearance.

POSTURE

It is advisable at this point to describe what is the best posture to adopt when at work, etc. In sitting, the pelvic bones should rest comfortably in the concavity of the seat and should press equally on it. The head should be almost vertically above this point and the spinal column erect. Both arms should rest equally distant from the spinal column. The feet should be firmly planted on the floor and the legs straight. This posture is less fatiguing than where the head is thrust forward, in which case the muscles supporting the head are being constantly exerted to prevent it falling further forward. The important point to guard against is sitting in a twisted position, whereby the muscles of one side are more contracted than those of the other. If such an attitude is persisted in, there is great likelihood of the development of spinal curvature. Such attitudes are adopted to obtain better lighting or to prevent copying, or because the desks are not of suitable size or form.

It is also important to prevent the body doubling up with the back bent and the shoulders drooped forward. This faulty attitude, if continued, results in a narrowing and flattening of the chest from insufficient respiration, and a permanent forward curve of the spinal column. Such a condition is especially likely to occur in children who cannot see clearly and who are developing a habit of placing their eyes too near their work. It also develops easily where there is no back-rest to the seat and the seat itself is too far back from the desk.

For standing, the best posture is one with the heels slightly apart and the toes pointed outward, the feet firmly planted on the floor, neither foot being in advance of the other. The body should be erect, with the chest well forward and the abdomen well back. The head should be well raised and look straight forward. This attitude cannot be maintained for long, and to relax the muscles, first one foot and then the other should be advanced.

Bad postures in standing are common. They are often secondary to faulty attitudes in sitting.

All children should be carefully watched to see that they adopt a correct posture, but this is especially important if they are anemic, or convalescing from some illness, or neurotic. In such children the muscles or nerves controlling them soon get tired and there is a tendency to relax them, with resulting bad posture.

It has been stated elsewhere how necessary it is to have frequent intervals of rest following bouts of activity. Children soon get tired of attempting to maintain a certain position for any length of time, and so there should never be any prolonged sitting without an interval for drill exercises.

For writing the child should sit perfectly square at the desk, with the body slightly sloped forward and the head straight. The left arm should support the page, which ought to be straight in front. The book should be parallel with the desk if upright writing is required; if a slight slant is desired, the book should be slightly tilted to the right. The right arm should rest on the desk. The pen should travel at right angles to the edge of the desk and the letters be formed boldly.

For reading it is best to stand up, with the chest well thrown forward and the head erect. The book should not be held nearer to the eyes than from ten to twelve inches. The child should stand so that there is a good light falling on the page of the book. If sitting, the same position of head and chest should be adopted.

AGE OF ATTENDING SCHOOL

The answer to the question as to when a child should attend school must vary, to a large extent, according to the social condition of the child. Where it is possible for him to stay at home and have adequate supervision over his welfare and a certain amount of instruction and training, there is no reason for his attending school until he is seven years old. In fact, he is better at home, because, in the first place, there is greater risk of infection when children congregate together, and the longer the development of contagious diseases can be postponed, the less the likelihood of a serious form of the disease arising, and the stronger the child will be to cope with it. Besides, there is a tendency in all schools to set work which entails a considerable

strain on the child's eyes, and if this work can be postponed until the age of seven years, there is much less risk of strain. Further, the hours of work which a young child should have are so short that there is little to gain by it. Although the child who stays away from school until he is seven or eight years old may be backward at first, he soon makes up for lost time, and later on is more likely to exhibit greater mental capacity than if his brain had been forced by premature work.

In the case of children who attend elementary schools the case is somewhat different, because the majority of mothers in this class are not able to devote the attention to their children's welfare which is desirable, either because they have to go out to work or because their time is fully occupied otherwise, at home. Consequently, we are of the opinion that these children should be allowed to attend school when they reach the age of five years, but this should not be compulsory if the parents are able to give them individual attention at home. They should not be permitted to attend school before five years of age, because of the great mortality from infectious diseases among children younger than five.

For those who do attend, the hours of real work should be very short. The time should be chiefly occupied by various forms of play, object-lessons, and story-telling.

The main aim at this early age, in our opinion, should be to inculcate the habits of discipline, observation, and attention; to impart general knowledge, more particularly with regard to natural objects; and to improve the physical health.

Open-air Schools.—Within the last few years great strides have been made in the building and equipping of open-air schools. These have been utilized mainly for children who are ill or convalescing from some illness. Children with anemia, malnutrition, nervous debility, those who have a tendency to tuberculosis, and those recovering from an operation for adenoids are chiefly the scholars who attend these schools. Very striking results have been obtained in these cases; the children would hardly be recognized, after three months' attendance, as the same children who were admitted. The drawn, tired look disappears, the plump face full of energy takes its place, pallor gives place to healthy glow, and apathy develops into activity.

There is a great future before this undertaking, and when it

becomes more universal and is utilized for healthy children before they get run down, there will be a great diminution in the amount of ill health which so often proves the starting-point for more serious diseases.

Until such schools are established, much may be done in the way of using existing conveniences as much as possible. Thus classes should be established out of doors, under the shelter of trees or covered-in playgrounds. More nature-study rambles might with advantage take place, also the teaching of certain subjects, such as arithmetic or geography, by practical demonstration out of doors, as far as possible.

One of the features of the open-air school which adds greatly to the benefit derived from the fresh air is the midday rest for two hours or so. At this time many of the children sleep.

The intellectual work should be reduced to a minimum where the school is used for debilitated children.

The school presents greater advantages when it is associated with some sanitarium where the children may have the same open-air life at night. If they go home a good deal of the benefit must necessarily be lost when they return, as so many do, to overcrowded homes, where the windows are rarely open and the sun seldom gains an entrance.

Education and Overpressure.—Some children are much more liable to develop symptoms of overpressure than others, partly because they are naturally more vivacious or highly strung, or keener. The continued application to work without adequate rest results in the onset of fatigue, both physical and mental, and this shows itself at first in the tired and heavy look, the drawn face, the difficulty in balancing the head, the listless voice, the disinclination to exert himself, and if he does so, the slow and often clumsy movements and the tendency to fall asleep. The night's sleep and rest should prove enough to cause all these fatigue signs to disappear, but if the overpressure continues the child fails to obtain the needful rest and wakes up in the morning still feeling sleepy, languid, and disinclined to get up. The expression becomes devoid of life. There may be knitting of the eyebrows or wrinkling of the forehead. The lower eyelids may become baggy. There is a want of alertness, the attitude is awkward, and the gait clumsy. The child cannot pay atten-

tion; the gaze wanders; the response is feeble; and irritability readily develops. If no steps are taken to remove the cause, the fatigue continues and the picture becomes more marked. The drawn lines become permanent. The face looks pale and pinched. The eyes are dull and sunken and heavy shadows encircle them. There are twitchings of the facial and other muscles. The outstretched hand is drooped and shows no vitality. There is an incoördination of movement. The child is restless and unable to get to sleep easily, and when he does lose consciousness vivid dreams trouble him and night terrors arise. The susceptibility to disease is greater owing to the reduced vitality and inability to cope with slight infection.

It is of supreme importance that parents and teachers should be on the lookout for some of these signs, so that the condition may not progress, and as soon as symptoms are noticed there should be a break in the work.

Among those who are likely to show these signs easily are the readily excitable, highly strung, nervous children; those convalescing from disease; and those with a tendency to rheumatism or tuberculosis. Greater care should be exercised with these children. There is too much of a tendency, which is inseparable from large classes, to consider all children as being equally capable of effort, instead of making allowance for individual cases.

We do not wish it to be understood that we are decrying effort. There can be no education without effort. The exertion of effort is a necessity if any progress is to be made, whatever the undertaking; and after it must necessarily follow the production of fatigue. But when fatigue has been produced, there should be adequate rest to recuperate, otherwise there will be overpressure commencing.

Many investigators have carried out experimental tests for eliminating fatigue. These tests have been based on three different methods: first, the physiological, in which the presence of fatigue is measured by the variations in functions of different organs; second, the psychological, by which the measurement of fatigue is gauged by the reduction in mental capacity; and third, a combination of the two, in which the variations in sensitiveness of the skin constitute the test.

A brief account of these methods is helpful in showing the futility of carrying on education under certain circumstances.

One of the chief methods under the first heading was the use of the ergograph. This is an instrument for measuring muscular fatigue. One finger is attached by a cord over a pulley to a weight. The flexion of the finger raises the weight a certain height. This proceeding is continued until the finger can no longer contract. Results of experiments in European schools with this instrument showed that bodily and mental exertion reduced the muscular power after a comparatively short time. This diminution of muscular energy disappears in one or two hours if a change is made in the work, especially if the change is from a hard to an easy subject. Severe mental fatigue, as measured by the ergograph, comes on with great regularity in the periods of mathematics and gymnastics; while, on the other hand, recuperation seems to take place during the periods of history, geography, and nature-study. Modern languages occupy, with respect to fatiguing power, a middle place. Singing and drawing, moreover, make greater demands on those who do well in these branches.

In the psychological method of testing fatigue, the basis for the estimation is the variation in the mental capacity of the person, as determined by speed and accuracy of working. There have been many different tests by various observers, but space forbids more than the mention of one or two.

In the case of fifty children whose average was nine years, they were given dictation for two hours. Only the quality of the work was analyzed. The task was divided into sections, each containing about thirty words. After a period corresponding to thirty minutes' work, there was a decided rise in the number of mistakes, which continued to the end of the time, thus showing that children become more careless, as time goes on, in their pronunciation, and lapse into the dialect of their homes, and that the teacher's words and manner have a diminishing effect as the fatigue of the class increases.

Comparatively similar results were obtained by the use of tests consisting of simple mathematical sums. These were changed every ten minutes. An interval of five minutes was then allowed, after which a further series of sums was worked

for ten minutes, and so on, to the end of an hour. The work done increased during each consecutive period owing to practice, but the mistakes increased in higher proportion. During the first ten minutes, 3 per cent.; during the second, 4 per cent.; during the third, 5.7 per cent.; and during the fourth, 6 per cent. of errors occurred; thus showing that it would seem best not to let lessons last longer than three quarters of an hour and to interrupt the continuation of lessons by pauses of about a quarter of an hour, so as to have the children's brains rested, the body moved, and the schoolroom air changed.

The influence of rest has been also demonstrated by experiments. Two series were taken: one of thirty minutes' dictation, and the other of thirty minutes' arithmetic. The quality of the work was compared after each school hour on days when there was no interval, with that on other days when there was a rest between the hours. The accompanying table shows the results.

In *a* there was no interval; in *b* there was a pause at 10 A.M.; in *c* there were two breaks, one at 9 A.M. and the other at 10 A.M.

	TIME	PER CENT. OF FAULTS	CORRECTIONS PER CENT.	PUPILS WITH NO MISTAKES PER CENT.
a.....	8 A.M.	.2	14	72
	9 A.M.	.3	12	60
	10 A.M.	.8	25	27
	11 A.M.	1.01	21	19.6
b.....	11 A.M.	.99	20	23
c.....	10 A.M.	.67	19	3
	11 A.M.	.6	16	35

All observers find that the most characteristic sign of fatigue is omission.

Investigations have shown that the midday rest has been insufficient to correct the fatigue of the morning. Many observers have upheld this view and condemn afternoon work as useless, advocating that the time should be spent in rest or technical instruction.

All these tests prove that it is useless to attempt to continue lessons beyond a certain period, as the average child cannot take in the instruction properly and the time is consequently wasted. The best results, too, would be obtained by adequate intervals of rest between the periods of work. In certain schools of

Switzerland it has been found that increased attention and energy in the next lesson follow a pause of ten minutes after each period of work, for relaxation of mind and body in the open air.

The last method of ascertaining the extent of fatigue consists in using an instrument for testing the sensitiveness of the skin to touch. This instrument is called an esthesiometer, and consists of two blunt points, one fixed and one movable. The two are placed on certain parts of the body. The movable point is moved away from the other until the person feels that there are two distinct points. The distance apart is then measured and recorded. Fatigue renders the sensitiveness of the skin less marked, so that the distance between the two points increases before they can be recognized as separate. Many observers have confirmed this fact that intellectual fatigue affects the tactile sensibility.

Apart from the effect of mental work in producing fatigue, there are many other factors concerned, such as ventilation, because the oppressive feeling induced by an insufficient elimination of heat and aqueous vapor from the body is a potent cause of the rapid onset of fatigue. It has been shown by most of the observers carrying out experiments such as those indicated above, that pure air gives increased capacity for work.

Fatigue is due to the production of poisons which check the functions of different organs. These have been removed experimentally by various means, such as massage, washing out, etc. Recent experiments give rise to the conclusion that the poisons are apparently at once destroyed in the blood. They exist mostly in muscle juice, and can also be removed from nervous structure, which rapidly recovers from fatigue when the poisons are washed out with normal saline solution. From the blood of animals treated with this poison a certain substance has been obtained which counteracts the effect of the poison; this is of the nature of an antitoxine. Recent experiments have also proved that spraying a one-per-cent. solution of this antitoxine in the classroom has, after five hours' work, resulted in an improvement of fifty per cent. in fatigue results. In further experiments it is found that exhaustion is not nearly so great on the days after using the spray, in spite of quite equal school

work. In certain tests it was found that there was an increase in the quality as well as quantity of work done after using the antitoxine spray. It is therefore concluded that the antitoxine spray is able to counteract the fatigue poisons found in the body and thus extend the limits of the working capacity of the whole organism.

As a result of the experiments above referred to, it would appear that great possibilities are opened out in the development of capacity for work.

Hours of School Work.—To a certain extent, this must vary with the individual child, for the highly strung child must have less than his more equable brother, as he uses up more energy in the same time. Younger children, too, require fewer hours' work than those who are older. The following table shows the number of hours of school work per week that should be permitted, according to the age of the child:

AGE	HOURS PER WEEK
5 to 6 years	10
6 to 7 "	12
7 to 8 "	15
8 to 9 "	18
9 to 10 "	20
10 to 11 "	22
11 to 12 "	24
12 to 14 "	28
14 to 15 "	30

Preparation of Lessons.—We think that, as usually carried out, this phase of school work is often detrimental to the child's welfare; particularly do we look upon it as bad where it leads to working late at nights, as is so often the case in day-schools. The practice, too, in boarding-schools, of doing an hour's work of this nature before breakfast, we regard as deleterious.

Examinations.—These apparently necessary evils lead to a good deal of excessive work just prior to the examination, and this tendency to cram and get through as much as possible in a given time is a very bad one, and is particularly pernicious where children of the nervous temperament are concerned, more particularly girls. In fact, if competitive work such as this leads to any of the symptoms or signs detailed under the head-

ing of overpressure, it should be stopped—at any rate, so far as those particular children are concerned.

The acme of all school teaching should be the all-around preparation of the child for the duties of adulthood. Examinations should be regarded as a small means to an end, and not as an end in itself.

Punishments.—In this connection, we would only say that the custom of punishing a child by detention indoors during playtime is one which should never be enforced. Recreation time is not too excessive in schools, that children can afford to lose what little they get. Hence, for the sake of their general well-being, and certainly for the sake of their ability to pay attention to their work, some other form of punishment should be devised. We think this is particularly important when the cause for the punishment lies in some error or apparent carelessness in lessons. These troubles are often due to an insufficient amount of open air and freedom, and to curtail this is only likely to make matters worse.

Holidays.—Holidays are or should be intervals of rest and recreation from the eternal grind of the school curriculum. From the point of view of health they are very important, and were it not for such welcome breaks probably many more children would succumb to the pressure of school work.

With regard to the weekly holiday, it is much better that this should be broken up into two half-days, rather than have it all on one day. It makes more of a break and is more in keeping with physiological principles. These intervals should not be frittered away in slackness, but there should always be some form of activity, whether it be a game or the pursuit of some hobby. The time, as far as possible, should be spent in the open air.

It is customary for school-children to get long holidays at stated intervals, and especially a very long time in the summer. There should really be no need for these prolonged breaks if the child is not subjected to pressure. Two or three weeks ought to be quite long enough as a period of relaxation from school work. There is no doubt, though, that as work is carried out at present, many children do require these long spells of freedom, owing to the detrimental effect of school work on their

physical and mental well-being. A striking proof of this is shown by the way in which children grow so much more during the holidays. It has been ascertained in some European countries that at the age of sixteen years boys put on as much weight during the three months' holiday as during the nine months' term.

We think the only form of holiday task which should be set should be the following out of some hobby, such, for instance, as collecting and pressing specimens of wild flowers, etc., but it should be optional.

While the system as outlined above has not as yet been adopted in this country, we hope that the importance of it will gradually be realized, and that in the near future its adoption will be general, as a national measure or as a local ordinance, throughout the country.

EMPLOYMENT OF CHILDREN OUT OF SCHOOL

This is one of the biggest problems in relation to school work; at any rate in certain of the industrial centers, where young children have to enter factories and do a certain amount of work before or after they go to school. It must be obvious that they can do justice to neither, for if they go to the factory in the mornings they start at a very early hour, and after working all the morning have a hurried midday meal and go to school in the afternoon. The fatigue produced by the long hours of working in a hot atmosphere, which is often very moist—it is stated that the temperature is seldom below 75° and in hot weather is higher—must prevent a child from acquiring any benefit from his school teaching. Measurements taken have shown that there is a difference of about one inch in height and two to three pounds in weight between those attending half-time and those who attend altogether.

Employment of children is more or less common all over the country, and in most cases is carried out either before going to school in the mornings or in the dinner-hour, or after school at nights. The kinds of occupation vary considerably. None of them need be harmful, but some of them, as carried out, are distinctly so to the physical development. Many observers have

noted a great degree of malnutrition and anemia among such children; and certain deformities, such as curvature of the spine, are distinctly more common in some employments.

In our investigation into the subject during the past few years, we have come to the conclusion that certain occupations, more particularly those which entail early rising, much hurrying, with inadequate time for meals, or late retiring to rest, do undoubtedly affect the physique, as exhibited by the growth in height and weight. In carrying out our inquiry we have separated the boys into different classes, and the various measurements are given in the accompanying table:

	NOT EMPLOYED	PAPER-BOYS	ERRAND-BOYS	MISCELLANEOUS EMPLOYMENT	SATURDAY WORKERS
Numbers	696	197	145	84	98
Average height in inches	57.5	56	56.9	56.8	57.3
Average weight in pounds	80.7	76.3	78.4	79.1	81.1

These occupations comprise those who deliver papers in the mornings. They have to get up between 5 and 6 A.M. and seldom go to bed before 9 P.M. Others, again, come into the category of errand-boys and have to deliver baskets of provisions, parcels, etc. Sometimes they have to carry heavy weights.

The height and weight of those boys whose occupations result in their obtaining an inadequate amount of sleep is considerably below that of others.

To our mind, this question of employment, as carried out at present, does produce a bad effect on the general physical welfare of the child. Consequently we think ordinances should be adopted by local authorities regulating the hours of work and not permitting children below a certain age to engage in occupations for remuneration before a certain fixed time in the morning or after a fixed hour in the evening; also that there should be restrictions as to the weights to be carried. Local authorities have power to adopt such by-laws.

In the present condition of economics it seems that this employment of boys is necessary, and if the work is regulated there is no reason why it should be detrimental to health. It is the

rush, the hurried meals, and the insufficient amount of sleep which are the great drawbacks, but it ought to be possible to insure that these need not be.

PREVENTION OF DISEASE

An important factor in fostering the health of the child is the prevention of disease. This is achieved by developing the child's resistive capacity to disease, as in a healthy state there is always a natural tendency to overcome any deleterious influence; but if the harmful influence is extremely infective or virulent, or if the dose of the poisonous agent is too great, then the defenses break down and disease arises. So that of equal importance in considering the welfare of the child is the method of preventing disease by exercising control over the sources of the injurious agent. This method is most applicable in the case of infectious and other diseases due to germs, but is carried out continually in connection with efforts to check disease; thus, where certain articles of diet are found to produce diarrhea, the disuse of such is the surest way to the eradication of the trouble, and the avoidance of such in the future constitutes this line of defense in the maintenance of a healthy condition.

In childhood the question crops up largely in connection with the infectious diseases. More particularly are we concerned here with its reference to school attendance and the risk of conveying the disease to others.

The congregating together of children from so many homes, in rooms where they must necessarily come closely into contact with one another, furnishes an easy way in which the disease may spread. Children who contract any infectious complaint should stay away from school and be kept from contact with others.

All children coming from infected homes should be excluded until a certain quarantine time has elapsed after the last contact with the infected person. Exceptions may be made to this rule for older scholars in the case of measles, whooping-cough, German measles, chickenpox, and mumps, where they themselves have previously had the disease.

The following table gives an idea of the length of time the child is infectious, the time at which he may resume attendance,

and the period of exclusion for children coming in contact with the disease:

DISEASE	DURATION OF INFECTION	DATE OF RESUMPTION OF SCHOOL	QUARANTINE OF CONTACTS FROM DATE OF LAST EXPOSURE TO INFECTION
Diphtheria	3 to 4 weeks; often longer	4 weeks after freedom from infection	21 days
Scarlet fever	6 to 8 weeks; sometimes longer	2 weeks after freedom from infection	14 days
Measles	3 to 4 weeks	4 weeks from appearance of rash	21 days
Whooping-cough	6 to 8 weeks	About 8 weeks when cough has ceased	21 days
German measles	2 to 3 weeks	3 weeks from appearance of rash	21 days
Chickenpox	2 to 3 weeks; as long as scabs remain	When scabs have disappeared	18 days
Mumps	3 to 4 weeks	4 weeks	24 days

The times stated in the last column refer to the interval elapsing after the disinfection of the premises subsequent to the removal of the child to a hospital. If the patient is treated at home and not properly isolated, the quarantine dates from the end of infection of the last case in the house to develop the disease.

The reason why it is better to avoid returning to school at once after cessation of isolation in the case of diphtheria and scarlet fever is in order to prevent, as far as possible, any danger of persistence of infection through sore throat, etc.; and also because it gives the child an opportunity to regain some of its strength.

DISEASES OF CHILDREN

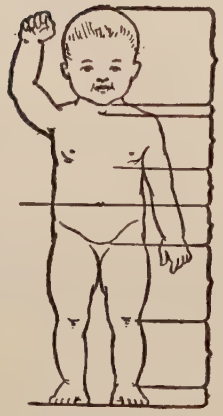
INTRODUCTION

AS the mother and nurse, rather than the physician, are called upon most often to deal with diseases peculiar to childhood, it is every mother's duty to understand not only the cause and prevention of the disease, but also the treatment.

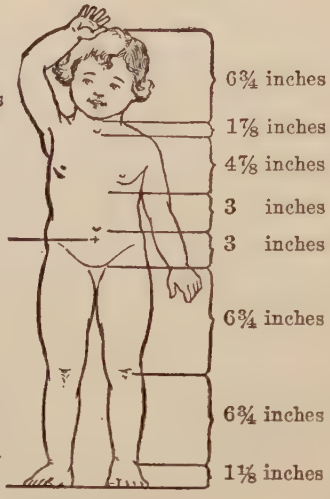
The belief that all children must have certain diseases is erroneous and often dangerous; frequently children have knowingly been exposed to contagious diseases such as measles, chicken-pox, whooping-cough, etc., because of this mistaken idea. There is no doubt that fifty per cent. of all sickness and suffering that comes to children could be prevented if the mothers had the proper knowledge. This department dwells particularly upon the causes, prevention, and simpler remedies, the use of which falls naturally within the scope of home treatment, and which every intelligent mother and nurse should know.

Children are liable to certain specific and peculiar maladies which occur between the ages of three and fifteen years, which constitute the period of childhood. Although some of the affections which occur during those ages are common to both children and adults, they are comparatively few, as certain infectious diseases of an acute nature are confined in their occurrence to the period of childhood, and they are generally regarded as diseases peculiar to children, or *children's diseases*. This designation is obviously based on the well established fact that children have a natural tendency to develop certain complaints which are very seldom, if ever, found in adults or infants; in other words, in those above or below the period known as childhood. These ailments are so designated for the reason that children come readily under their influence and that upon exposure and contact they are very liable to contagion. Children

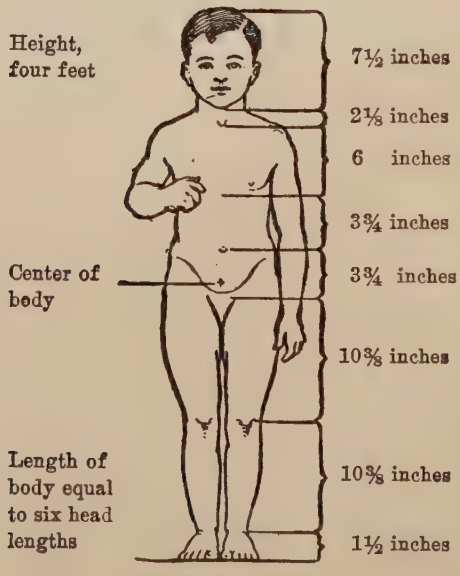
BODILY PROPORTIONS AT VARIOUS AGES



SIZE AT BIRTH



SIZE AT TWO YEARS



SIZE AT FIVE YEARS

are usually free from the likelihood of a second attack, owing to the well known fact that these affections, or, strictly speaking, the majority of them, never recur.

The advice here given, if properly followed, will prove a valuable adjunct to the physician's services, which it is by no means intended to displace or supplant. In the treatment of the more serious ailments, a physician should always be consulted.

The doses mentioned herein are, unless otherwise stated, for children ten years of age. For proportionate doses for younger or older children, consult the Table of Doses in the "Home Nursing" department.

PECULIARITIES OF CHILDREN

The fact that children cannot put into words or cannot correctly estimate the nature of troubles and pains from which they suffer, coupled with the great importance of remedying as early in life as possible any physical or mental defect, or any bad habit, makes the observation of their peculiarities of great importance.

Activity.—For some weeks after an infant is born the only signs of intelligence, apart from the performance of the merely animal functions, consist in constant movements of the lips, head, and limbs. The fingers are constantly opened and shut, the legs drawn up and down, and the lips pouted, while the child is awake; and the vigor of these movements gives a good idea of the vitality of the child and a general index of its future brain power. At about the third or fourth month the child should begin to develop the power of attention, as shown by its staring fixedly at any bright or moving object presented to it and ceasing these movements while its attention is so engaged. During the sixth month teething, with the various disorders of the alimentary canal, skin, etc., incidental to it, begins. A delay in teething is one of the signs of rickets. About the end of the first year of life the child should be gaining the power to stand and walk.

Crying in early childhood is the great manifestation of pain. The most common pain is that known as "gripes" and associated with indigestion, in which the cry is of a wailing character, with a note of ill-temper. In head pain the cry is of a sharp, piercing

nature. In older children frowning is a common symptom of headache, especially when it is due to eye-strain.

Temperature is not much of a guide to disease in children, because the temperature-regulating mechanism is easily thrown out of gear, and a severe whipping may send up the temperature to 103° F., for several hours.

Fullness under the eyes, disappearing when the child smiles, indicates a lax condition of the facial muscles, and may be due to tiredness, or, if it be habitual, to a weak general condition. Fullness, however, which is lasting, and so great as partially to close the eyes, and which is increased after sleep, is usually a symptom of Bright's disease, for which treatment should be sought without delay.

An open mouth in breathing, especially when deafness and shortness of breath accompany it, is usually due to enlargement of the tonsils and adenoids in the throat. A child so affected is generally found to snore when asleep.

Accompanying these symptoms in older children we find broadening of the bridge of the nose, narrow nostrils, and often narrowing of the roof of the mouth with projecting front teeth.

The expression of the face is often of great importance. Brain disease causes contractions of the facial muscles producing the appearance of emotions quite foreign to childhood, and causing the deep lines which, in middle-aged persons, are supposed to denote character. The head, too, is often drawn back in such a case, and the back arched. Deep hollowing of the eyes during an attack of summer diarrhea and vomiting is a grave sign, indicating great exhaustion. The size of the cranium is large in children compared with that of the face. At birth the proportion is about eight to one, though the face rapidly grows in size. On the top of the head is the "fontanelle," or soft spot, which is at birth about a square inch in size, and gradually closes as the bones grow, till, at the end of the second year, it should have disappeared. Premature closure, with narrowing of the forehead, predisposes to idiocy, though it does not necessarily cause mental deficiency. Late closure, with the development of a lofty, intellectual-looking forehead, is one of the signs of rickets.

Bad postures in children, such as standing on one leg, stooping at the shoulders, and leaning the left elbow on the table at

lessons, should be discouraged as tending to produce deformities. The latter habit may produce considerable curvature of the spine and defective development of one side of the chest in a few months.

Nervousness may show itself by twitching movements of hands and feet, and a shy, nervous child is apt to be unintentionally clumsy. Twitchings and grimaces very often show the beginning of St. Vitus's dance, and children are apt to be punished for these quite involuntary peculiarities, such punishment only aggravating the condition. Grinning on every occasion, however, shows a want of control over the muscles of expression, and indicates a low-class brain and necessity for careful upbringing. Convulsions in young children are due to many causes, and when some nervous disease is the cause they form a serious symptom, although much more common in children and not by any means so grave as fits of similar severity in adults. Incontinence of urine, showing itself generally by wetting of the bed, may be a bad habit in a nervous child and capable of correction by punishment or by careful treatment, but often it is a sign of the need for circumcision, and is cured by this slight operation.

Left-handedness is often taken for a sign of stupidity, and children are punished when they do not use the right. This is a great mistake, because the condition is due to the fact that the side of the brain governing the left hand has developed in advance of the other. The child may, however, be taught to do certain things with the right, and so become able to use either hand with equal facility.

The teaching of children should not be forced before the age of seven, and up to this age should be directed rather to teaching habits of study, orderliness, and regularity. The teaching of good habits should begin at birth. This may be done, for example, in the matter of feeding. The periods at which the child is to be fed having been determined upon (say every two hours), these should be rigidly adhered to, despite the child's crying. It is astonishing how soon the child accepts this discipline and ceases to cry for food at irregular times. Present-day teaching in the kindergartens and primary schools is directed toward instructing children how to observe and study rather than toward cramming them with facts. After the age of seven is reached,

the child's brain is quite capable of enduring some fatigue, and regular lessons should be begun, or the child will learn idle, loafing habits. It is a common mistake of parents to encourage "smartness," which shows itself in readiness of repartee and ability to repeat the sayings of others in a parrot-like fashion, for this indicates an impressionable and unstable brain. A much more hopeful sign is a certain amount of slowness in answering questions, which indicates power of thought.

Sleep should be longer the younger the child, and nervous children should have a specially good allowance. The following table gives approximately the minimum periods of sleep at different ages:

The first twelve months	20	hours a day
The second year	13 to 15	" "
Second to fourth year	11 to 13	" "
Fourth to seventh year	9 to 11	" "
Seventh to twelfth year	about 10	" "
Twelfth to sixteenth year	" 9	" "

FOREIGN BODIES IN THE NOSE

Young children will at times place small objects, such as peas, beans, and other foreign bodies, in the nose. These objects, unless too firmly embedded, can usually be removed by causing the child to sneeze or by blowing the nose hard, if at the same time the free nostril is closed by pressure. To cause sneezing, tickle the inside of the nostril with a feather or snuff up a little pepper or snuff. If the object is not pushed too far up the nostril, it may often be removed with tweezers.

FOREIGN BODIES IN THE EAR

If hard objects, such as peas, buttons, etc., become lodged in the ear, do not use force in trying to remove them. If not lodged too far in the canal, they can often be removed by means of a bent hairpin. Sometimes such articles can be removed by laying the child on the affected side and pulling the lobe of the ear outward and backward; this will widen the canal so that the object falls out. If this does not remove the substance, syringe the ear with warm olive oil or tepid water, using a blunt ear-

syringe; insert the nozzle at the upper part of the opening and at the same time pull the lobe outward and backward while the head is held to one side, with the affected ear down.

Insects which may have entered the ear are easily removed by dropping warm olive or sweet oil into the ear as soon as possible, and following this about fifteen minutes later with a tepid water irrigation, using a blunt ear-syringe for the purpose.

FOREIGN BODIES IN THE EYE

In cases of dust, cinders, and other foreign bodies which may enter the eye, it is often unnecessary to apply means for removal, as the tears will wash the substance away, provided the eye is not rubbed. If, however, the substance adheres to the under side of the upper lid, taking hold of the lashes and pulling the lid away from the eyeball and at the same time downward, well over the lower lid, and then letting go of it, will often remove the body.

If the substance is under the lower lid, pull it well down, and remove the object with the tip of a silk handkerchief which has been moistened, or with a little damp cotton which has been wound around a toothpick. If the child is older, an effective way is to let the child, if the foreign body is under the upper lid of the right eye, take hold of the lashes and turn up the lid as far as possible; at the same time, place the left arm as far as possible behind the back and keep a standing position with the head thrown back. Keep this position for about a minute; at the end of this time the substance has usually left the eye.

If the object is below the lower lid, pull that down and keep the rest of body in the same position as before. If the object is in the left eye, use the left hand to hold the eyelid and place the right hand behind the small of the back.

Irrigating the eye with a boracic acid solution by means of a medicine dropper will often remove the object. For this purpose, the child should lie on his back, with the eyelids widely separated and enough of the solution put in the eye to flush it thoroughly.

Blowing the nose as hard as possible will also often remove the substance from the eye.

FOREIGN BODIES IN THE THROAT

Children will at times swallow objects such as fish-bones, which will lodge in the throat. If lodged near the entrance of the throat, they can often be reached with the little finger and pulled out. If too far down to reach, swallowing a piece of a crust of bread will usually dislodge it and carry it along to the stomach. A smart slap between the shoulder-blades will also often dislodge the substance.

Round articles such as coins and buttons, and even a pin, will usually be carried without trouble to the stomach. Coins and buttons will usually pass through the bowels and be evacuated without trouble, so that no laxative medicine is required unless the child is constipated. In the latter case, a dose of castor-oil should be given. The stools are to be watched for the foreign body; eating of potatoes and bread will help to pass it along.

TONGUE-TIE

Tongue-tie is said to be present when the little fold running from the under surface of the tip to the floor of the mouth is shorter than normal. If pronounced, it prevents the tip of the tongue from being protruded; it makes nursing difficult in babies, and if allowed to persist it may cause a lisp.

A slight operation is all that is necessary, but it must be done carefully, owing to the risk of hemorrhage.

BURNS

Never wash a burn with water, but cover it as soon as possible with a substance, either liquid or paste, which will keep out the air. Small burns are best treated with the following:

Butter or Lard.—Cover the burn with a layer of butter, lard, vaseline, or any other greasy substance that may be at hand, and bandage.

Olive or Linseed Oil.—Pour olive or linseed oil over the burn, and bandage. Any other oil, if the foregoing are not at hand, will do.

Baking-soda.—Apply thickly by means of a wet cloth, and bandage.

Lime-water and Linseed Oil.—Take equal parts of these; mix; apply freely and bandage.

Flour.—Covering the burn with flour, or flour and olive oil, and bandaging it, is very good.

Heat.—If a finger or hand is burned, holding the member over a stove and getting as near to the coals as the pain will allow, is very good. It is a painful but beneficial operation.

If blisters form, they should be opened by means of a needle which is pushed through the healthy skin at the edge of the blister and the water gently squeezed out. Do not break the blister or remove the skin.

In cases of severe burns, they should be treated with a one-per-cent. picric acid solution in water applied on lint, or wet picric acid gauze may be used. After the lint or picric acid gauze has been applied, dress with absorbent cotton and bandage.

CUTS

Children are likely to get small cuts and wounds which, in themselves, if properly cared for, are harmless, but which, through infection, may become serious.

It is a necessary precaution to disinfect any abrasion of the skin, no matter how small, for a germ is just as likely to enter the system through a small cut as a large one.

Disinfect all cuts and wounds at once with peroxide of hydrogen, iodine, carbolic acid solution, or any other antiseptic that may be at hand. Always dress a cut, no matter how small, with collodion, applied with a camel's-hair brush or with absorbent cotton, over which adhesive plaster is to be placed so as to keep out dirt and air.

Never bathe a cut with plain cold water, as it contains millions of harmful germs. If no boiled water is at hand, always add boric acid, carbolic acid, or similar medicament to the water used for washing out a wound.

The last point to be attended to is to secure rest to the injured part, so that the natural processes may go on unimpaired. This is, as a rule, easily secured.

BRUISES

Olive Oil or butter applied over the bruise is very soothing and will relieve the pain.

Kerosene Oil.—Saturate a piece of cloth with kerosene oil (coal oil) and apply to the bruise; it will relieve the pain. Turpentine may be used instead, if kerosene is not at hand.

Tincture of Arnica applied to the bruise is beneficial.

Witch-hazel.—Bathe the affected area with witch-hazel; it is very beneficial.

Alcohol.—Bathe the part with a solution of two parts of alcohol to one part of water.

Ice or Ice-Water.—Applying a piece of ice wrapped in a cloth, or cold water, if ice is not at hand, will relieve.

SPRAINS

A sprain is a sudden and forcible stretching of the ligaments and tendons connecting with a joint, without dislocation of the joint occurring. It is always accompanied with very severe pains and followed by inflammation and swelling.

The treatment should be directed toward prevention of inflammation. The injured part should be kept in an elevated position so as to keep the blood from rushing to the spot.

In cases of sprained ankle the foot should be elevated, kept at rest, and cold or hot water applied.

Cold Water.—Place the foot, as soon as possible after the accident, in an elevated position, and apply a cloth wrung out of ice-water to the ankle, or apply an ice-bag.

Hot Water.—Nothing compares with a hot foot-bath (which must be prolonged for an hour or more) in decreasing the pain and swelling. Place the foot in as hot water as can be borne, and gradually increase the heat by adding more scalding water; in this way the foot can stand a tremendous amount of heat. The favorable results obtained are in direct ratio to the height of the temperature—the greater the heat, the better the results. Between soakings, the affected part should be rubbed with a camphor or other stimulating liniment.

When the acute symptoms have disappeared, the sprained

area should be favored by systematic rubbing and application of liniment with massage, and the joint tightly bandaged.

DISEASES OF THE RESPIRATORY SYSTEM

One of the means that tend to the proper and normal development of the child and the maintenance of its health is the preservation of a sound condition of the air-passages during the early years of life. In those passages local disease is common and may produce a weak spot which will furnish an acute affection with an entrance to the system. The breathing is likely to be seriously obstructed by disease, and this implies imperfect ventilation of the lungs, incomplete aeration of the blood, that is, the change of the blood from venous into arterial blood, and stunted growth generally.

The diseases of the air-passages involve separate local areas, and several of these areas are frequently involved by direct spreading at the same time. For example, a simple cold may very soon spread to the pharynx, larynx, and bronchial tubes.

COLDS

A cold in a child should always receive prompt treatment; this, however, must depend upon what part or organ is chiefly affected, whether the nose, throat, eyes, or digestive organs.

In mild cases, only a simple treatment is necessary, such as soaking the feet in hot mustard water and drinking hot lemonade on going to bed. If the bowels are costive, give a mild laxative.

If there is much thirst, give hot lemonade or linseed tea. The following is also a good remedy:

℞ Sweet Spirits of Niter one-half ounce
Syrup of Lemon one ounce
Water two ounces
Mix.
Directions: Give one dose every three hours.
Dose: 1 year twenty drops
2 years forty drops
3 years one teaspoonful
6 years one and a half teaspoonfuls
9 years two teaspoonfuls

Severe Cold.—For this, the following treatment will be found beneficial:

℞ Salicylate of Soda one teaspoonful
Rhubarb and Soda Mixture three ounces
Mix.
Dose: One teaspoonful in a wineglass of water every four hours.
This can be given to a child four years old.

Colds of Long Standing.—The following remedy will be found very good for a cold that has been hanging on for some time:

℞ Vinegar two tablespoonfuls
Molasses one teacupful
Butter one teaspoonful
Boil for two or three minutes.
Dose: One teaspoonful as often as required.

Or:

℞ Rock Candy one ounce
Pure Whisky two ounces
Glycerine one tablespoonful
Water two ounces
Mix.
Dose: One teaspoonful every four hours.

Camphor.—Add ten or fifteen drops of spirits of camphor to a cup of hot water; sip as hot as possible.

Red Pepper.—Take one teaspoonful of red pepper, put it in a teacupful of boiling water, and let stand for one hour; strain through fine muslin. Take one teaspoonful of this liquid to a teacupful of hot water; repeat every two or three hours. On going to bed, put a teaspoonful in a cup of hot milk and drink; place a hot-water bottle to the feet and cover the patient with blankets. Avoid exposure to any drafts the following morning.

Colds on the Chest.—The following remedies will be found useful:

Lard and Turpentine.—Melt half a pound of lard and add one teaspoonful of turpentine; rub on the chest and cover with a heavy piece of flannel.

Lard and Red Pepper.—Mix one teaspoonful of red pepper with a teacupful of lard and apply to the chest; cover with a heavy piece of flannel.

Colds in the Head.—Use the following:

Menthol and Chloroform.—Dissolve ten grains of menthol in one-half ounce of chloroform; rub on the palm of the hand and inhale; also rub on the bridge of the nose.

Cold in the Nose and Throat.—Use the following:

Borax.—Place a small piece of borax, about the size of a pea, on the tongue and let it dissolve.

Salicylate of Soda.—Have the druggist make up twenty-four five-grain powders of salicylate of soda. To a child twelve years of age, give one powder morning and night; for a child six years of age, divide a powder into two doses.

Local Treatment.—As a special local treatment, the nostrils should be painted, irrigated, or sprayed with a lotion consisting of the following:

℞ Bicarbonate of Soda twelve grains
Biborate of Soda twelve grains
Chloride of Soda ten grains
Antiseptic Solution one-half dram
Tar-water one ounce
Mix.

Directions: One tablespoonful with two tablespoonfuls of warm water, and use two or three times a day, according to the amount of the discharge, the number of hardened crusts present, and the extent of the obstruction.

Or:

℞ Dobell's Solution one ounce
Boiled water three ounces
Mix.

Directions: Use in nostrils night and morning; apply either on cotton or in an atomizer.

Or:

℞ Peroxide one ounce
Witch-hazel one ounce
Boiled water two ounces
Mix.

Directions: Apply to the nostrils, night and morning.

Benefit will also be derived by introducing a little hazeline cream, witch-hazel ointment, or weak boracic ointment into and around the nostrils at night.

Although these directions and instructions seem quite elaborate for the treatment of naso-pharyngeal catarrh, or cold in the head, it is well to remember that such a simple cold, if not attended to promptly, is likely to extend; in fact, it will extend down to the respiratory passages. Moreover, if a chronic cold should become established and be favored by the habits of life, there is a tendency in the child to breathe through the mouth instead of through the natural air-passages, and this habit provides an easy and convenient path for the development of adenoid growth in the naso-pharynx, of chronic tonsilitis, bronchitis, and inflammation of the trachea or windpipe.

Preventive Measures.—During early life, a cold may very easily be prevented by plenty of fresh air, warm clothing suited to the season of the year, and a proper diet. Indeed, it will often be found that children who suffer from these colds, attacks of which tend to recur, are, for the most part, regarded as delicate. The consequence is, therefore, that they have been weighted down with extra clothes by day and have been literally hidden under blankets during the night, in addition to being confined in overheated and stuffy rooms. The natural and unavoidable result is that a chill is brought on immediately after exposure out of doors.

NOSEBLEED

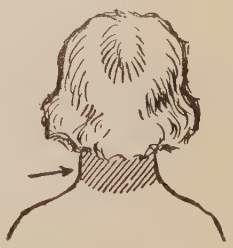
Bleeding from the nose may be due to a variety of causes or may apparently have no cause at all. The severity of the bleeding varies considerably and may require very energetic treatment in some cases, whereas in others it can be left alone, as it is not infrequently nature's method of getting rid of the superfluous blood in the body; the latter is often the case in young, healthy children.

Cases in which the bleeding is fairly free for a period and then tends to cease of its own accord, may be left untreated; there are, however, cases in which the bleeding is but a symptom of some general disease of the body. The nature of this bleeding is a continuous dribbling.

Frequently recurring slight bleedings in children should lead

to having the nose examined, as some foreign body impacted in the nose may be the exciting cause.

Treatment.—*Ice.*—Place a piece of ice at the back of the neck on the spot indicated by the shaded area in the accompanying illustration; also place a piece of ice on the bridge of the nose, or snuff up ice-water and hold it in the nostrils for a few minutes.



Alum.—A solution of alum and water, or powdered alum, snuffed up the nostrils, will often relieve.

Turpentine.—Add one tablespoonful of turpentine to a pint of boiling water and inhale the fumes.

Paper Pad.—Make a pad by folding a piece of blotting or other coarse paper several times, and place under the upper lip; press firmly upon it for a few minutes by drawing the lip down tight.

Cotton Pledget.—A small pledget of cotton soaked in a solution of alum or very weak solution (1 to 1000) of adrenalin and packing the nostrils with it, will stop severe bleeding.

Finger Pressure.—A very old and effective remedy is as follows: the patient stands upright; if the left nostril is bleeding, he places the left forefinger against the bleeding nostril and raises the right hand straight above his head, palm open and fingers extended as if reaching for an article just above his reach. One minute of this position will usually stop the bleeding; if not, hold the position for another minute. Three minutes is the limit of time for even very severe bleeding to stop. If the right nostril is bleeding, place the right forefinger against the nostril and raise the left hand above the head. This method will leave the nostrils clear, as no blood-clot forms, especially if the nostrils are cleaned by blowing the nose before commencing the above treatment.

ADENOIDS

Definition.—The condition known as adenoids should be suspected in any child who snores at night, or who constantly keeps the mouth open. By adenoids is meant an overgrowth of the glandular tissue normally found at the back of the upper part

of the throat, where the nose opens into it. This glandular tissue is similar to the tonsils in structure, and enlarged tonsils usually coexist with adenoids. The condition is common in childhood, and tends to disappear after the age of fifteen.

Causes.—These are not fully known. It is common in cold and damp climates and weakly children, and seems to run in some families. Most cases appear, however, to develop after one of the acute fevers, such as measles, whooping-cough, etc.

Symptoms.—The adenoids give rise to local symptoms, and to more distant symptoms directly due to the obstructed breathing. As a local result of blockage we find that the child constantly keeps his mouth open to breathe through, and snores at night. The open mouth gives him a dull, stupid expression. There is a constant tendency to nasal catarrh, the speech may have a nasal twang, and there is deafness from catarrh in the Eustachian tubes which lead from the upper part of the throat to the ears. The respiratory obstruction, especially if the child is weak or rickety, is apt to lead to deformity of the chest—pigeon-breast, etc. By reason of the imperfect aeration of the blood the growth is stunted and the child is languid; to this and to the deafness the backwardness of these patients is due. They sleep badly, nightmare is common, and there is reason to believe that asthma and convulsions may sometimes be due to adenoids. Patients with adenoids are more than ordinarily liable to infectious diseases, and the growths themselves may subsequently become the seat of tubercular disease.

Treatment.—It will be seen that, although the condition tends to cure itself ultimately, its continuance for even a few years leads to such dire results, both physical and mental, that earlier measures are imperative. No instructions can be given for their prevention, beyond seeing that children are taught to breathe deeply and through the nose, and that there is no tight clothing interfering with breathing. Every child is the better for being made to spend a few minutes, night and morning, taking long, deep breaths through the nose. There is no medicinal treatment for adenoids. Except in the mildest cases—those in which the child can sleep with the mouth shut—the adenoid growths must be removed by operation. The operation of scraping them away is a comparatively mild one, although requiring an anesthetic. It is usually combined with the excision of the

enlarged tonsils, and there is seldom any reason for delay once the condition has been recognized. After the operation, breathing exercises are even more valuable than before. These are too often neglected, but it is a great mistake to omit them, as, owing to the child not having been able to fill the lungs properly, the chest is never well developed, and may even be deformed. The child must be patiently and systematically taught before a mirror how to breathe at all times through the nose, and, by taking deep breaths for two or three minutes several times a day, to expand the lungs and chest.

The following is an excellent lotion:

℞ Bicarbonate of Soda twelve grains
Biborate of Soda twelve grains
Chloride of Soda twelve grains
Glycerine twenty drops
Water one ounce

Directions: Mix one tablespoonful of the above with two tablespoonfuls of warm water. Spray the nose and throat with this solution morning and night.

TONSILITIS

Definition.—This disease is very common in children. One attack seems to give the child a predisposition to another, and the repeated attacks invariably result in chronic enlargement of the tonsils. The ailment is usually attended with fever, and very frequently the only symptom by which the disease may be detected is a temperature of 103° or 104° F. The child may not complain of either pain or difficulty in swallowing, and unless it should be kept in mind that tonsilitis is frequently a cause of feverishness, the condition may be entirely overlooked.

Causes.—There is, indeed, such a marked connection between tonsilitis and many of the eruptive fevers, that it is advisable in every case of sore throat to make an examination for a rash, and in every case in which a rash is doubtful there should be an examination for tonsilitis.

An attack of tonsilitis is often rheumatic in origin, and unless the nature of this form be recognized, very serious results are

likely to follow. Although tonsilitis is associated with many conditions, it is not at all possible to distinguish them by means of inflammation of the tonsils. The common distinction which is to be made is between acute tonsilitis and acute follicular tonsilitis, which means inflammation of the tonsils in which the follicles or minute sacs are involved.

Acute Tonsilitis.—Acute tonsilitis is usually the outcome of some external infection, and at first one tonsil may be involved, and later the other is likely to be included in the condition. The duration of the attack is from three to seven days, and the patient should be kept in bed during the whole of the fever stage; in cold weather, even for some days longer.

Treatment.—It is advisable to give at the beginning one or two grains of calomel, at night, and a dose of Epsom salts or magnesia in the morning. The calomel should be given in one-fifth grain doses every ten minutes, until one to two grains have been taken.



By repeating this treatment in half doses, on the two following nights, unusual benefit will follow. If there should be much pain or much glandular swelling in the neck, hot fomentations or poultices applied over the shaded area shown in the accompanying illustration, employed at intervals, will afford considerable relief.

In the case of older children, however, cold applications instead of hot ones may be used. It is well to bear in mind, also, that gargles and sprays are quite unsuitable factors in childhood, and painting the tonsils in simple tonsilitis is of very doubtful benefit. In order to allay pain, give glycerine or bismuth lozenges. Throughout the acute stage the following medicine has a highly beneficial action, whether the origin of the tonsilitis be rheumatic or not:

℞ Salicylate of Soda two and one-half drams
Bicarbonate of Soda five drams
Syrup of Ginger one and one-half drams
Water, to make four ounces
Mix.
Dose, for children from one to twelve years of age: One-half teaspoonful in water, three times a day.

Follicular Tonsilitis.—Follicular tonsilitis, or ulcerated sore throat, is that form of tonsilitis in which the follicles, or small sacs, are specially involved. The inflammatory products are exuded or sweated out, and they appear as small, yellowish-white specks on one or both tonsils. These specks may increase later, and they unite to form large soft patches, covering a large portion or the whole of the tonsil. It may often be difficult to distinguish the condition from diphtheritic tonsilitis. The exudation or sweating in follicular tonsilitis is usually yellower in color, of a softer consistency, and can be stripped off more readily, leaving no raw or bleeding surface. Moreover, the fever is higher in the former, the illness develops more acutely, and the patient at an early stage has the appearance of being more ill than is the case in diphtheria.

Treatment.—The treatment for this affection consists of rest in bed, plain, simple diet, and purgatives, the same as in acute tonsilitis. It is advisable to give chlorate of potash and iron in maximum doses, as follows:

℞ Chlorate of Potash one and one-half drams
Liquor of Chloride of Iron . three drams
Chloroform-water three ounces
Syrup four drams
Distilled water, to make ... six ounces
Mix.
Dose: One teaspoonful in half a glass of water, every three hours.

The throat and nostrils should be sprayed with a solution of peroxide of hydrogen.

Rheumatic Tonsilitis.—The diagnosis of rheumatic tonsilitis must be made by means of the presence of other signs of rheumatism, or by means of the persistence of the tonsilitis. Pain while swallowing is usually a very prominent symptom, and there may be some stiffness of the neck, or pains about the legs. Whenever a simple tonsilitis does not yield to treatment and there is a continuance of the temperature, it is safe to suspect the existence of rheumatic tonsilitis. The treatment should be the same as for rheumatism elsewhere.

Suppuration.—Peri-tonsillar abscess, which is abscess near or about the tonsils, occurs less frequently in childhood, when

connected with acute tonsilitis, than it does in adult life. There may be considerable enlargement in the neck in connection with acute tonsilitis. In childhood, suppurative adenitis, which is inflammation of a gland, and which is the result of tonsilitis, is quite common. Indeed, it is by far more so than in adult life. When there is pus in one or more glands, an operation is the only treatment possible.

PHARYNGEAL ABSCESS

This affection is by no means uncommon during the first year of life, and it may very seriously endanger the life of an infant if it should not be diagnosed in time.

Causes.—It is the result of inflammation and suppuration in the post-pharyngeal lymph gland or glands, which are situated behind the pharynx. The abscess may be confined to the region of the pharynx, and is usually situated sideways rather than centrally. In other cases, the abscess spreads into the surrounding tissues and is likely to produce a swelling in the side of the neck.

A condition of pharyngeal abscess which occurs less frequently is that associated with spinal caries, of which it is sometimes a complication, and requires special surgical treatment. The ordinary abscess is usually the result of some local infective disorder, often slight, so that it may not be observed until the symptoms which the abscess produced have caused alarm. These symptoms are due to the obstruction which the bulging abscess caused. Swallowing becomes difficult, respiration is obstructed, and in addition to difficulty in breathing, attacks of cyanosis may occur; that is to say, the skin of the patient may become blue in color. It is usually possible to make a diagnosis by means of the spluttering character of the breathing. Even setting aside the violent attacks of difficult breathing, it is easily possible to observe that the breathing is obstructed, and from the absence of any sniffling of the nostrils it is usually possible to identify the breathing in the throat as the result of obstruction in the pharynx. There is considerable secretion of mucus, which may be poured out freely from the child's mouth.

Treatment.—The only possible treatment for this affection is to open the abscess as soon as possible. This operation must be

performed by a physician. Recovery is usually very rapid after the pus has been drawn out.

QUINSY, OR INFLAMMATORY SORE THROAT—CYNANCHE TONSILLARIS

Definition.—When the tonsils, commonly called the almonds of the ear, or the mucous membrane lining the throat becomes inflamed, it is termed quinsy, or inflammatory sore throat. It generally affects the young and sanguine, and occurs more especially in the spring and autumn.

Causes.—The most common causes of this disease are the sudden checking of perspiration, wet clothes, wet feet, damp beds, moist air, exposure to cold, irritating food, etc. An inflammation of the throat is often occasioned by omitting some part of the covering usually worn about the neck. Singing or speaking loud and long, or whatever strains the throat, may also cause an inflammation of that organ. It may also proceed from pins, bones, or other sharp substances sticking in the throat, or by sitting near an open window. This disease is sometimes epidemic and infectious. When there is chronic inflammation of the throat, it ought to be sponged every morning, or oftener, with cold salt water.

Symptoms.—An inflammatory sore throat reveals itself by a difficulty of swallowing and breathing, accompanied by a redness and tumor in one or both tonsils; dryness of the throat; foulness of the tongue; shooting pains in the part affected; hoarseness of the voice; a frequent but difficult excretion of mucus; and some small degree of fever. As the disease advances, the difficulty of swallowing and breathing becomes greater, the speech is very indistinct, the dryness of the throat and thirst increase, the tongue swells and is incrusted with a dark fur, and the pulse is full, hard, and frequent, beating from 100 to 140 a minute. In a few cases, small white, sloughy spots may be observed on the tonsils, and in very violent cases there is complete deafness. When the symptoms are considerable, the whole face partakes of it: the eyes are inflamed, the cheeks florid and swollen, respiration is performed with difficulty, and the patient is obliged to be supported in nearly an erect posture, to prevent suffocation. Even delirium and lethargy sometimes supervene

and stop respiration. Occasionally, both tonsils are very much inflamed and swollen, so that it becomes exceedingly difficult to give any kind of nourishment.

It may terminate in the formation of pus, though in some cases it subsides without it, terminating by what is called resolution. When pus forms, the parts affected become more pale and less painful, and a sense of pulsation is felt, with very slight chills. The matter is often discharged into the throat and passes into the stomach, when relief immediately follows.

Treatment.—If the pulse is full and strong and the head painful, bleeding may be resorted to, and a dose of Epsom salts should be given. This should be followed by wine of ipecac, twenty drops every three hours, accompanied with frequent drinks of flaxseed tea or flaxseed lemonade. If the swelling, heat, and pain in the throat are considerable, leeches should be applied to it, or in mild cases, or when the patient is feeble, a poultice of flaxseed meal, to which have been added lard and laudanum, must be applied to the throat, over the area as shown by the shaded lines on the accompanying illustration. When the poultice is changed, bathe the throat with a liniment of ammonia, or soap liniment to which ammonia water has been added.



The following gargle may be used:

℞ Honey one tablespoonful
Vinegar two tablespoonfuls
Sage tea, or water, to make half a pint
Mix.

Sage.—An infusion of sage sweetened with honey of roses may be used as a gargle; also a weak solution of alum when matter forms in the tonsils and they burst. A generous diet should be allowed, and wine, or the following tonic, may be taken:

℞ Dilute Nitric Acid one and one-half drams
Infusion of Calumba or Cascarilla .. six ounces
Compound Tincture of Cardamom .. one-half ounce
Mix.
Dose: One teaspoonful three times a day.

When the tonsils remain enlarged after the disease is cured, the following liniment may be used:

℞ Camphor Liniment six drams
Soap Liniment two ounces
Tincture of Cantharides one dram
Mix.
Directions: Rub the outside of the throat twice a day.

Tannin or Nitrate of Silver.—Touching the tonsils with a strong solution of tannin or nitrate of silver will sometimes cause them to shrink to their natural size. A strong solution of alum applied to the tonsils will occasionally prove beneficial. Tincture of iodine applied to the tonsils is said to effect a cure.

Emetic.—In the early stage, give an emetic of lobelia and ipecac, permitting the patient to drink warm sage tea while taking it. He may also be allowed to steam the throat over the following decoction:

Herb Tea.—Hops, wormwood, sage, boneset, hoarhound, catnip, a handful of each being placed in boiling water. The hot vapors should be permitted to rise around the throat of the patient, who at the same time can inhale them into the throat and lungs. If all of these herbs cannot be procured, use three or four of them.

Lemon juice and honey mixed together and administered frequently will be very servicable and refreshing, and may be used instead of a gargle.

Mustard-water.—The feet should often be bathed in hot mustard water, and the body should also be bathed two or three times a day, especially where there is high fever.

Pokeroot Poultice.—Much benefit has been derived in some cases by the application of a poultice made by roasting fresh pokeroot in the ashes until it is softened, when it should be washed and applied warm, several times every day.

If the disease assumes a chronic character, the following will be found an invaluable application:

℞ Saturated Solution of Sal Ammoniac .. four ounces
Tincture of Cayenne Pepper two drams
Mix.
Directions: Use as a gargle, several times a day.

When the tonsils become enlarged and remain so, the following may be used:

℞ Tannic Acid twenty grains
Common Salt forty grains
Extract of Blood Root two grains
Ointment of Roses one ounce
Mix.
Directions: Apply on outside of throat.

Or:

℞ Iodine twenty drops
Cold Cream one ounce
Mix.
Directions: Apply on outside of throat.

LARYNGITIS

Definition.—Laryngitis, or inflammation of the larynx, is a very common disease in early life, and it is likely to be associated with an ordinary cold, by spreading from the nose or throat, or it may be a part of an acute infective illness. It is well to bear in mind that during the period that measles is invading the system, acute laryngitis, with loss of voice, cough, and marked signs of obstruction, may be present before the rash has actually appeared. These acute symptoms, however, usually disappear quite rapidly as soon as the rash has appeared. Laryngitis is also likely to be connected with diphtheria, syphilis, or more rarely tuberculosis.

The form of laryngitis which will here be considered is that known as laryngitis stridulosa, which may be regarded as a type of acute laryngitis. This is a disease which is often met with in children from three to five years of age.

Causes.—This ailment is invariably caused by exposure to cold, either directly or through a catarrh extending from the nose above to the mucous membrane of the larynx. It invariably accompanies some of the infectious diseases in which the throat is very liable to be injuriously affected, such as measles, scarlatina, diphtheria, smallpox, and erysipelas. Moreover, it is a well established and generally recognized fact that this affection is

also induced by inhaling irritating particles and vapors and by swallowing very hot fluids.

Symptoms.—With respect to the symptoms of this affection, it may be stated that the larynx presents certain changes, the chief among them being considerable redness and swelling which affects the whole interior of the cavity but is specially marked where the tissues are loose, such as the vicinity of the epiglottis, or covering for the opening of the larynx, and the vocal cords. The effect of all this is that the channel for the entrance of air is much narrowed, and the chief dangers lie in this narrowing.

The symptoms vary with the severity of the attack, but along with some degree of feverishness and constitutional disturbance there is some degree of heat, dryness, and difficulty in swallowing. Cough is constant and is either loud, barking, or clanging, or else husky and without tone. This cough is at first dry, but is afterward accompanied with expectoration.

The voice, like the cough, is rough, husky, or may for a few days disappear almost entirely. The breathing shows clearly that there is some obstruction in the larynx, both inspiration and expiration being prolonged and difficult, with a somewhat hissing sound and with almost no interval between the two acts. In severe cases the face and surface generally become black and blue, and there is a threat of suffocating, especially during the coughing fits. In cases that are favorable in their course—and these are really in the majority—there is a tendency in the attack to abate in a few days, but, on the other hand, death is likely to occur suddenly while the patient is in a fit of suffocation. Particularly in the case of children is this so. There are many cases of laryngitis that are so comparatively slight that they are made known only by hoarseness and the character of the cough. Nevertheless, it is best and safest to give prompt and serious attention to the attack in every instance, as the nature of the malady demands it.

Treatment.—The treatment of this serious affection consists in keeping the patient in bed in an atmosphere of 60° to 70° F., made moist by steam, and the room should be well ventilated. The food should be light, non-stimulating, and given in small quantities at a time. Chicken or veal, milk, barley, and whey are a sufficient dietary. A steam-kettle with the vapor impregnated

with carbolic acid, or creosote, or cresoline may be allowed to play about the bed for fifteen minutes at a time. Do not shut the child up in a steam tent, or keep the steam playing about the bed continuously, because the heavy, hot, and damp atmosphere which is thus brought on becomes most trying and almost unbearable. The use of steam at regular and fixed intervals affords considerable relief and does not cause depression. It is also advisable to apply fomentations round the neck, as shown by the shaded area in the accompanying illustration, but there should be an intermission of the application at the end of one or two hours of continuous use. They may, however, be again applied at intervals, but it is worthy of note that they seem to lose their beneficial effect if employed continuously, and to increase the patient's discomfort.



Compound Tincture of Benzoin.—Probably the best treatment of all is to add a teaspoonful of the compound tincture of benzoin to a pint of water in a tea-kettle. Bring the water to the boiling-point and keep it there, and let the patient inhale the steam for a few minutes at a time; repeat every hour, or as often as a coughing fit threatens. A good method of inhaling the steam is to fit a cornucopia of paper over the spout, but care must be taken not to come too close with the mouth to the spout, or the hot steam may burn the sensitive tissues.

It is advisable to give, at the beginning of the attack, a brisk purge consisting of two grains each of calomel and jalapin. The spasm is often induced by irritation of the stomach and intestines, and a thorough evacuation of the bowels will relieve the inflammation.

When there is much swelling of the mucous membrane in the upper portion of the larynx, as shown by great obstruction of the breathing, scarification of the parts with the aid of the laryngoscope may afford relief, and it may be necessary even to perform the operation of tracheotomy, where death from suffocation seems to be threatening.

It is possible to prevent attacks of laryngitis to a great extent, in persons who are liable to them, by a course of living calculated to brace and strengthen the system, such as cold baths, regular open-air exercise, and simple, nourishing foods.

BRONCHITIS

Definition.—Bronchitis means inflammation of the mucous membrane of the bronchial tubes; it may be either acute or chronic. Usually, only the larger tubes are affected, but in some cases it spreads to the smaller bronchi and is then known as capillary bronchitis, while in still another form there is a fibrinous exudation upon the lining membrane of the bronchi.

Causes.—It will invariably be found that during the first two years after birth at least fifty per cent. of the cases of bronchitis are associated with and due to rickets.

While all rickety children are especially liable to attacks of bronchitis, the affection is of more common occurrence in fat, flabby children; and in all cases of excessive stoutness there will be the same tendency, which is probably due to the obstruction in the circulation caused by the fatty tissue. A condition of chronic congestion of the veins in the lungs follows this obstruction, and catarrh of the bronchial tubes is brought on.

Overfeeding is another factor to which this condition is frequently due. The blood is overcharged with food substances, the pulmonary or lung circulation is overtaxed in an effort to get rid of these, and then venous congestion and bronchial catarrh follow.

Treatment of an Acute Attack.—The treatment of an acute attack varies in some respects, according to the season of the year, for artificial warmth and confinement to one room are quite necessary during the cold season, while in the warm weather it is not advisable to confine the child to one room. In winter the air of the room must be kept fresh and the temperature should not exceed 62° F. The breathing is obstructed under any conditions, and the difficulty is increased if the air is impure, stagnant, or overheated. Therefore, as a means of securing favorable conditions, it is advisable to obtain the largest possible room for the sufferer, to place the bed away from the walls, and to dispense with curtains, so that the air may have free access.

Care should also be taken that the sick-room contain as few people as possible, due to the fact that the atmosphere is used by them. It is advisable that infants suffering from bronchitis or any other pulmonary affection be kept in bed, in order to save

their breathing power as much as possible; they must not be carried about or bathed in the ordinary way. The rest given the body causes respiration to be far more easy, and the usual washing can very conveniently be done in bed.

During the acute fever stage the diet should be fluid and in small quantity. Milk and barley-water, whey, gruel, chicken, or veal soup are quite sufficient. Give freely of warm drinks, such as hot barley-water or flaxseed tea, as they are the best for increasing the flow of the urine and the saliva. If the patient, as often happens in the early stages, is suffering from a dry, irritating cough, very great relief may be obtained by inhaling steam.

If, on the other hand, the bronchial secretion is free or in great abundance, then the use of steam is not at all necessary. It is very important to bear in mind that steam should not be used continuously, as it is weakening and exhausting to the patient, nor should the bed be surrounded with closed curtains.

The full benefit of the vapor will be secured by allowing the steamer to play over the bed from the far end for fifteen minutes at a time, to be repeated every hour or two, as long as the condition continues. By adding creosote or terebene to the water, the beneficial effect of the vapor will be increased. Although poulticing has somewhat fallen into disfavor as a routine measure, there are, however, special indications which make hot applications to the chest quite necessary. The form of such applications should be fomentations, as these are much more easily prepared and much more likely to be applied hot. Fomentations are likely to give relief in the condition for which inhalation has been recommended, viz., the dry stage, in which there is a deficiency of secretion. In bronchitis, a considerable amount of difficulty in breathing is often present, coupled with loud wheezing, usually due to spasm of the bronchial tubes, as is shown by the spells in which the wheezing appears.

When these difficult breathing attacks from spasm occur, relief will often be obtained by the application of hot fomentations to the back and front of the chest, while the beneficial effect of the fomentation will be greater if a dram of turpentine is added to each quart of hot water. If plain hot-water fomentations are used, they can be applied continuously for an hour, and then at intervals. It is never advisable to apply fomentations or poul-

tices to the chest continuously, but if the practice is carried out at intervals, according to the indications of the symptoms, considerable relief is almost sure to follow. In mild cases it will only be necessary to apply a stimulating liniment to the chest twice a day. The following will be found very good:

℞ Turpentine Liniment three ounces
Belladonna Liniment one dram
Sweet-oil two ounces
Mix.
Directions: Rub into the chest thoroughly.

Special care should be taken that the breathing will in no way be interfered with by anything tight about the chest or the abdomen, and the body temperature must be maintained by means of hot-water bottles. Open the bowels at the beginning of the attack, giving, for this purpose, three grains of rhubarb powder and two grains each of gray powder and carbonate of magnesia at night, to be followed by a dose of Epsom salts or magnesia in the morning. This will be of great assistance in improving the condition of the alimentary tract, which is often affected with catarrh, and it will also aid in relieving the congestion of the bronchial tubes. It is advisable to repeat half doses of the above, every second or third night. A simple fever mixture may be given, which is as follows:

℞ Spirits of Mindererus four drams
Citrate of Potash forty grains
Syrup of Orange one and one-half drams
Camphor-water, to make two ounces
Mix.
Dose: For children from one to twelve years, three times a day:

1 year forty drops
2 years one teaspoonful
3 years one and one-half teaspoonfuls
4 years two teaspoonfuls
9 years one tablespoonful
12 years one and one-half tablespoonfuls

The foregoing medicine will often be found quite sufficient throughout the whole course of the illness. It is a matter of

common knowledge that the treatment of bronchitis and other pulmonary affections has been, for the most part, one of expectorant or cough mixtures. It is common to find patent medicines containing drugs to increase expectoration, or to diminish it, or to effect both at the same time. Indeed, there is no certainty that many of the drugs recommended and employed act as they are supposed and expected to; and as, in addition, they often contain habit-forming drugs, they should, on general principles, not be used at all.

In the early stage, when secretion is deficient and a harsh, irritating cough may be associated with the dry catarrh of the tubes, two grains of iodide of potash and one and one-half grains of carbonate of ammonia may be added to each dose of the above given mixture, or may be used separately, as long as necessary. This, however, is not required when secretion is free; and it is only when there is an over-abundance of secretion that there may be any interference for the purpose of lessening it, which may be effected by the following:

℞ Tincture Belladonna one dram
Dil. Nitrohydrochloric Acid forty-eight drops
Glycerine two and one-half drams
Comp. Infusion of Gentian . two ounces
Mix.
Dose: For children from one to twelve years, every four to six hours:

1 year	forty drops
2 years	one teaspoonful
3 years	one and one-half teaspoonfuls
4 years	two teaspoonfuls
9 years	one tablespoonful
12 years	one and one-half tablespoonfuls

When the child suffers with an obstinate cough, the nasopharynx and throat should be examined for signs of irritation, which may be relieved by a lotion for the nostrils, or a simple throat lozenge. In other cases, especially when coughing disturbs the night's rest, from five to ten drops of paregoric may be given for relief. It must not be forgotten that a certain amount of coughing and expectoration necessarily accompanies

bronchitis, but it is only when these are excessive that medicinal sedatives are to be employed. It is easily possible to enable the patient to rally by giving due and proper attention to his warmth, by hot applications to the chest and moist inhalations when necessary, and by plain diet.

The disease may be fatal only in the case of children of a very weak physique, or when they have been debilitated by previous illness. In rickety children there is often a serious complication in the softened walls of the chest and lack of tone in the muscles, which makes ordinary breathing quite labored. This complication greatly interferes with the increased respiration that bronchitis makes necessary. It is not advisable to use alcoholic stimulants in the treatment of bronchitis.

While the child is in the convalescent stage, care must be taken to ascertain that he has a sufficient amount of animal fat, the chief forms of which are butter, cream, beef and mutton fat, yolk of eggs, and cod-liver oil. By combining cod-liver oil and hypophosphates, as in the following mixture, better results can be obtained in restoring the bronchial tubes to a healthy condition than it is possible to obtain from any other drugs:

℞ Hypophosphate of Soda twenty-four grains
Hypophosphate of Lime twenty-four grains
Cod-liver Oil three ounces
Oil of Cassia five drops
Glycerine four drams
Tragacanth twenty-four grains
Water, to make six ounces

Mix.

Dose: For children from one to twelve years, three times a day:

1 year forty drops
2 years one teaspoonful
3 years one and one-half teaspoonfuls
4 years two teaspoonfuls
9 years one tablespoonful
12 years one and one-half tablespoonfuls

If anemia is present, raw meat juice, green vegetables, and iron in small doses should be given.

ASTHMA

Definition.—In childhood, asthma presents the same peculiar feature as it does in adults, namely, sudden attacks of difficult breathing, the inspiration being short and the expiration prolonged. This is accompanied by lividity of the face and distress; there is no fever.

Causes.—It comes and goes in different localities and at different times, in a way which it is most difficult to understand, and in order to benefit the patient by any course of treatment, one of the essential things to be done is to build up the health and to correct any errors in diet, or any local disease that may be present. That it is in many cases inherited, can hardly be doubted.

As the nervous constitution underlies the malady, it should not be overtaxed by lessons or excitement, or mental strain of any sort.

Preventive Treatment.—The diet ought to consist of elements that are quite simple and non-stimulating, giving principally the fats and carbohydrates, such as fruits, grapes, and milk-sugars; the proteids, especially the meat proteids, should be given in moderation.

Care must be taken to avoid overloading the stomach, as this frequently induces an attack; the meals must, therefore, be quite moderate in quantity. It is often advisable to give small portions of meals at frequent intervals, so as to prevent the disturbance in the stomach which brings on an attack. Do not give indigestible substances, such as pickles, cheese, strawberries, shell-fish, or foods that cause formation of gas in the stomach or intestines. It frequently happens that a certain article of diet which is quite harmless to other children may bring on an attack of asthma in those that are susceptible or easily brought under the influence of the disease; therefore care must be taken to forbid and exclude this particular food from the diet. The tendency to bronchitis is very often present, therefore this, when found existing, must be properly and effectually treated. The treatment includes due and careful attention to the upper breathing passages, the nostrils and the pharynx. While the cure of asthma ought not to be expected from the re-

moval of adenoids, very great improvement will often follow the restoration of breathing through the nostrils. After this relief has been secured, it is often found that the attacks occur less frequently and the general health of the patient begins to show signs of improvement.

The improvement in the general health is usually progressive and gradual, and the tendency is for the asthma to become less and less marked with the passing of time. It is quite usual to expect a favorable course of the disease in childhood, provided that the patient is in reasonably good surroundings, and that the instructions given are faithfully and intelligently carried out.

Treatment.—In the treatment of asthma with drugs, the principal objects to be attained are: to maintain the regular evacuation of the bowels; to allay and prevent the bronchial spasm; and to lessen the tendency to catarrh of the bronchial tubes. Regulate the bowels by giving a dose of cascara or senna at bedtime. In an acute attack of asthma, the following mixture may be given:

℞ Bromide of Soda one teaspoonful
Iodide of Potash one-half teaspoonful
Anise-water two ounces
Mix.
Dose: For a child nine years old, twenty-five drops in water, three times a day.

The best tonic for the bronchial tubes is the emulsion of cod-liver oil, with hypophosphates, and in all cases of chronic asthma the use of this should be continued for several months.

Saltpeter.—Saturate a sheet of blotting-paper or any other kind of porous paper with a strong solution of saltpeter; let dry; then soak in oil of origanum; let dry again. When a paroxysm of asthma is felt, light a piece of the treated paper and let the child inhale the smoke.

Tincture of Lobelia.—In severe cases, five drops (for a child eight years old) of the tincture of lobelia may be given every half-hour until the patient feels sick at the stomach and vomits; it relaxes the muscles, thus relieving the asthma.

Hot Mustard Foot-baths.—These have frequently a very beneficial effect, as have also hot drinks, especially lemonade.

Tartar Emetic.—One pill containing one hundredth of a grain of tartar emetic, given every half-hour until the child feels sick at the stomach, has been found beneficial.

Amyl Nitrite.—A pearl of amyl nitrite crushed in a handkerchief and the fumes inhaled is invaluable in many cases; it usually relieves the spasm. It must, however, not be used, under any circumstances, if the child has heart trouble of any kind, and only on doctor's orders.

Strong Black Coffee.—Sometimes half a cupful of strong black coffee taken at the beginning of an attack will prevent it.

A very valuable mixture to take between attacks, particularly in those cases which show a weak heart, is the following:

℞ Tincture of Digitalis one dram
Tincture of Strophanthi one-half dram
Spiritus Glycerylis Nitratis twenty-four drops
Tincture Cardamomi three ounces
Mix.
Dose: For a child eight years old, give fifteen drops three or four times a day.

CANCRUM ORIS—GANGRENOUS STOMATITIS

Definition.—This is a very serious disease of childhood between the ages of one and five years, in which foul, deep ulcers form on the inside of the lips and cheeks, so that frequently a large part of the cheek may be eaten away.

Cause.—Cancrum oris is a rather rare disease; it is seen most frequently in children who have just recovered from measles.

Symptoms.—There is usually only very slight pain, but the prostration is very great. Death usually results from exhaustion or blood-poisoning.

Treatment.—The treatment consists in the removal or destruction of the ulcers and the tissues for some distance around the affected area, by means of strong caustic, such as pure nitric acid. This sort of treatment, while often successful in checking the spreading of the infection, leads to a hideous deformity.

CANKER OF THE MOUTH—THRUSH—SPRUE

Definition.—This is a disease to which children, and more particularly infants, are subject. It appears in small white ulcers upon the tongue, gums, and around the mouth and palate, resembling small particles of curdled milk. When the disease is mild, it is confined to these parts; but when violent and of long standing it has in rare cases been found to extend through the whole course of the alimentary canal, from the mouth down to the anus, and excites severe purgings, flatulences, and other disagreeable symptoms. It does not attack the nose, larynx, and air-passages. The disease, when recent and confined to the mouth, may, in general, be easily removed; but when of long standing and extending down to the stomach and intestines, with improper treatment, it very often proves fatal. The thrush sometimes occurs as a chronic disease.

Causes.—Want of cleanliness of the mouth is generally the cause of this disease. The mouth of the child should be washed out with a wet rag after every meal, especially if nursing from a bottle. Feeding the unfortunate infant with sugar and molasses, or allowing it to suck little bags of sugar and bread, are other causes.

Symptoms.—First, pain and uneasy sensation in the gums, which soon become hot, dry, and very sensitive, attended with languor, indisposition to play or move about, loss of appetite, thirst, gums becoming swollen, spongy, and bleeding when touched; the internal surface of the cheeks and gums is spotted with patches of false membrane, under which, when wiped off with a brush or rag, appear small bleeding points or even small ulcers. These patches have the appearance of curds of milk, for which they may sometimes be mistaken. It is, however, easy to distinguish between curds adhering to the surface of the mouth and the false membrane of sprue; the former, when wiped or scooped off, leave the surface perfectly healthy, whereas if the false membrane of sprue, which is closely adhering, is removed, it exposes small bleeding points and sometimes ulcers. This condition occasions such a tenderness and rawness that the child cannot take any food of a solid nature; neither can he drink any acidulous or spirituous liquors without the greatest

pain. It is accompanied with a dry skin, pale countenance, low pulse, and cold extremities. These symptoms will probably continue for some weeks, the general health being sometimes better and sometimes worse. The teeth also occasionally may become loosened and fall out. There may be a copious discharge of offensive bloody matter from the mouth. The movements of the jaw are stiff, and swallowing is very much interfered with, accompanied with soreness of the neck and throat. The child loses strength rapidly and becomes very much prostrated.

Treatment.—The treatment is in the main preventive. In infants, the nursing-bottles and nipples should be kept scrupulously clean. The mouth should be cleansed after each feeding with a boracic acid, or bicarbonate of soda, or salt solution, so that every particle of food which may start the fermentation be removed.

In most cases a deranged stomach is the cause, and this must be corrected. The general treatment calls for plenty of fresh air, stimulants, and the best possible hygienic surroundings. The medicinal treatment consists mainly of local applications (after the mouth has first been cleansed with a soft brush or cloth) of the following:

℞ Powdered Borax two teaspoonfuls
Glycerine one tablespoonful
Water one tablespoonful

Mix.

Directions: Apply with a swab several times a day. Boracic acid may be substituted for borax; or boracic acid or borax may be used without the glycerine.

Or:

℞ Chlorate of Potash three grains
Sugar one-half teaspoonful
Water two ounces

Mix.

Directions: This is for a child three years old, to be used as a mouth wash; for a child one year old, use only one grain of the potash; and for a child eight years old, use five grains of potash to the same amount of water.

Borax and Sugar.—One teaspoonful of powdered borax to four teaspoonfuls of powdered sugar; mix thoroughly, and place a pinch of this mixture on the child's tongue. It will dissolve and the tongue will work it around so that it comes in direct contact with the infected surface.

ULCERATED STOMATITIS—ULCERATED INFLAMMATION OF THE MOUTH

Definition.—This is a form of inflammation characterized by the formation of small ulcers on the inside of the cheeks, lips, and tongue, with copious salivation, pain, fetid breath, slight fever, and at times prostration.

Causes.—This affection is very common in children. It occurs most frequently after teeth have been cut. As several members of the same family are often affected at the same time, it would seem to be an infectious malady. Uncleanliness of the mouth is another frequent cause.

Symptoms.—The usual symptoms of this affection are extreme tenderness of the mouth, more or less looseness of the teeth, profuse salivation, offensiveness of breath, and slight fever.

The ulceration, which is at first patchy and around the teeth, has a tendency to extend to the tongue, lips, and the mucous surfaces of the cheeks. Larger patches are likely to be found by the union or coalescence of smaller ones. The cheek is not affected excepting where it comes in direct contact with the ulcerated gums; here it becomes ulcerated and covered with the same pulpy, yellowish deposit as that on the gums.

Treatment.—The diet should be of such a nature as not to irritate the mouth, which is usually extremely sensitive. During the acute stage, milk, milk gruel, and boiled bread and milk are quite sufficient. As an aid in relieving both the local condition and the constitutional disturbance, give one grain of calomel on three nights in succession, followed by a dose of saline purgative in the morning. The chlorate of potash is the most useful drug; indeed, it may be considered a specific, but if used locally, it gives rise to intense pain and its effect is not so beneficial as when taken internally; its action is aided by the addition of iron.

The following is a good combination:

℞ Chlorate of Potash one dram
Liquor of Chloride of Iron two drams
Simple Syrup five drams
Distilled water, to make four ounces
Mix.

Dose: Three times a day in milk or barley-water, as follows:

1 year one teaspoonful
2 years one and one-half teaspoonfuls
3 years one and three-quarter teaspoonfuls
4 years two teaspoonfuls
9 years three teaspoonfuls
12 years one tablespoonful

Or:

℞ Chlorate of Potash one teaspoonful
Water four ounces
Mix.

Dose: For children at various ages:

1 year thirty drops
2 years forty-five drops
3 years one teaspoonful
5 years two teaspoonfuls

Directions: Give one dose every hour on first day; on second day, every two hours; for a few days following, three times a day.

One teaspoonful of chlorate of potash in four ounces of water, used as a mouth wash, is very good.

CONVULSIONS

Definition.—Convulsions are rapidly alternating contractions and relaxations of the muscles, causing irregular movements of the limbs or body generally, and usually accompanied by unconsciousness. They form really only a symptom of some other trouble, often, in children, of a very trifling nature, but, on account of the alarm they cause and their occasional seriousness, they are treated of as a disease by themselves.

Causes.—It is calculated that, of children under one year old who die of nervous disorders, nearly three fourths succumb to convulsions. This tendency rapidly passes off as age increases, and is attributed to the undeveloped state of the brain and consequent instability of the whole nervous system in young children. It is aggravated by heredity in the children of nervous parents and of alcoholics, while, if one child has convulsions, younger members of the same family are liable to have them also at a later date, in consequence of any slight irritation.

Irritation in the bowels is perhaps one of the commonest exciting causes. This may be due to worms, to indigestion caused by unripe fruit, stones, etc., and, in the case of breast-fed infants, to some impoverishment of the mother's milk. Irritation about the mouth from inflamed gums, due to teething or the presence of thrush, is also very often the cause. Irritation in the ear, such as that due to wax, or in the nose from a foreign body, like a button pushed up by the child, is also sufficient cause. Even some discomfort or pain set up by the clothes may be the reason in very nervous children.

Excessive crying, excessive coughing as in whooping-cough, and the onset of some acute disease, like measles or scarlatina, may all be accompanied by convulsions.

Failing any obvious cause, rickets may be coming on, a tendency to convulsions being often one of the early signs of this disease. Lastly, serious brain disease, such as meningitis, may, in a small number of cases, be the cause.

Symptoms.—There are generally premonitory symptoms for some days, such as broken sleep, twitchings of the face, and sudden startings. The attack begins generally with twitchings of the face, rolling of the eyes, or grinding of the teeth, then the head and neck after a few seconds are bent back, and the limbs are alternately bent and stretched out. The part most affected is indicated by the shaded area in the accompanying illustration. Unconsciousness comes on speedily. There may, for a little time, be blueness of the face, but this passes off, and copious perspiration breaks out. The pulse is feeble, the breathing rapid, and sometimes



the bowels and bladder move involuntarily. The duration of the attack may be only a few minutes or may be hours, or the child may pass out of one fit into another.

Treatment.—The first thing to be considered is the immediate treatment of a convulsion, which usually comes suddenly. Mild measures may sometimes succeed in allaying the disturbance, and among these the hot bath is strongly to be recommended.

Hot Mustard Bath.—Add a tablespoonful of ground mustard to the water; the latter should be of a temperature of about 100° F. The child is placed into this bath with as little disturbance as possible, in such a manner that the entire body except the head is covered by the water. Place a towel wrung out in cold water on the child's head. Let the little patient remain in the water for from three to five minutes; then dry him quickly with a warm towel and put into bed, rolled up in a hot blanket, to promote sweating.

Hot Pack.—The hot pack is often just as effective and causes less disturbance. In order to do this, roll the child in a hot wet blanket for five or ten minutes until the skin has been thoroughly reddened; then roll it in a dry hot blanket. There must not be any excitement about the child, nothing but quiet and calm; and as a means of securing quiet, all friends should be requested to leave the room, leaving there the nurse alone. If the fit should, however, persist, or if it should return quickly, give the following injection through the rectum:

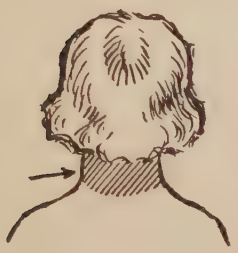
℞ Potassium Bromide ten grains
Water one ounce
Mix.
This is for an infant of twelve months; at six months, give five grains of the bromide; and at two years of age, fifteen grains.

It is, however, advisable to give, before the injection, an enema of soap and water, both for obtaining relief by means of evacuation and for preparing the rectum for the injection of the medicine.

Sometimes the inhalation of nitrite of amyl may be tried, and continued until the face has become flushed. Although this acts quite excellently in some cases, yet the result is rather uncertain

and it is not at all possible to say positively beforehand, in what cases it is likely to succeed.

A piece of flannel saturated with hot water to which have been added five drops of turpentine, and applied over the back of the neck as indicated by the shaded area in the accompanying illustration, has often proved very beneficial.



The fits being temporarily checked, an opportunity is afforded to examine into the nature of the exciting cause. It will be found that a large meal or some indigestible food had been taken and had been followed by signs of discomfort in the abdomen. An emetic composed of one or two grains of sulphate of copper in two ounces of water should be given; and an examination of the abdomen will frequently show signs of intestinal disturbance in the form of flatulence, the accumulation of excreta, or other kindred condition, and no time should be lost in administering one grain of calomel, or one grain each of calomel and jalap.

The temperature should be taken, and if any definite fever condition is found, it is reasonable to suspect the attack of some acute affection, such as tonsilitis, pneumonia, or infectious fever.

In some cases, a wasted, starved, and neglected child will be found in a collapsed condition and suffering from convulsions due to absolute debility. In such a case, give stimulating substances, such as hot milk and brandy. In an acute stage, signs of rickets will often be found, and these clearly reveal the underlying disease, which must of necessity be treated.

It is quite usual that an attack which begins apparently in a simple convulsion may become so severe as to affect the nervous centers permanently. This is clearly shown by mental defect or paralysis of the brain which follows. It is the severity and duration of the convulsion on which the likelihood of such a permanent injury depends. Convulsions are likely to prove directly fatal if the child should happen to be delicate, and this is quite independent of the presence of any other malady. Convulsions have a tendency to recur, sooner or later, unless due and strict attention be directed to every important, particular detail in the life of the child which may be their cause.

Peppermint.—Essence of peppermint will be found an excellent remedy. Dose, two or three drops in sweetened water.

THE ERUPTION OF THE TEETH—TEMPORARY AND PERMANENT SETS

Instead of having teeth which grow in size with the increase of bodily stature, we are supplied with two sets. The first, called variously the deciduous, temporary, or milk teeth, are twenty in number, ten above and ten below. They make their appearance above the gum, not all together, but in groups in a definite order, at times which vary considerably with the individual, between the ages of six months and the beginning of the third year, the growth of the roots not being complete until between the fourth and sixth years. They differ from the permanent teeth in that they are much smaller; their walls are thinner, the central pulp larger in proportion, and the ends of the root have a larger opening.

They consist of four incisor or cutting teeth, two central or first incisors, and two lateral or second incisors; two cuspid or canine teeth, miscalled eye-teeth—these are tearing teeth; and four molars or grinding teeth in each jaw. The times of their eruption may be given in tabular form, as follows:

	MONTHS AFTER BIRTH	USUALLY TAKING
Lower central incisors	7	1 to 10 weeks
Upper central incisors	9	4 to 6 "
Upper and lower lateral incisors	12	4 to 6 "
First molars	14	1 to 2 months
Canines	18	2 to 3 "
Second molars	26	3 to 5 "

But these times vary so much that they can only be considered as approximations.

Before dealing with the question of the function or care of the temporary teeth, it might be well to say a few words on the process of teething. In the case of perfectly healthy children it should not, and frequently does not, give rise to any serious disturbance of health. The growth and changes which are then going on are, however, so rapid that a considerable demand is made upon the nervous and physical frame of the child.

It is only right, however, to remember that along with this development of the teeth is going on the development of the other organs of the body.

The avoidance of difficult teething depends very largely on the proper and careful feeding and rearing of children in the first six months of their life.

The primary essential is absolute cleanliness, first, of all feeding and drinking vessels, and care in the preparation of food so far as artificial feeding is or has to be resorted to; and, second, of the mouth itself. The coverings of an infant's mouth are extremely delicate. Teething tends to produce an inflamed condition, and spoiled food may so readily set up digestive troubles and render the state of affairs much more serious, that too great care cannot be taken.

The cleaning of a child's mouth can best be done by wrapping a shred of absorbent cotton on the point of the forefinger, which of course should be carefully washed. Dip the cotton in sterilized (boiled) water or a saturated solution of boric acid, and go gently and carefully over the mouth, especially between the cheeks and the gum, and under the tongue. When the teeth are cut a camel-hair's brush may take the place of the piece of cotton.

Twice a day is sufficient for this cleaning until the child is about three years old, when it may be supplied with a small and soft tooth-brush, and be gradually trained to use it for itself. The habit of cleansing the mouth and teeth cannot be too early established. It will require patience and many lessons, and a utilization of the imitative faculty of children in letting them do what they see the mother doing.

Although teething is frequently a trying time, the dangers need not be exaggerated. The number of deaths from teething has been given as 4.8 per cent. of children under one year, and 7.3 per cent. of children under three years. The children of the poor suffer most, and it is just where the mothers have least chance, both before and after the child is born, and where the child has least of good and suitable food, cleanliness, and fresh air, that teething becomes a critical time, and adds most to the terrible tale of infantile mortality.

It is difficult to attach too much value to the temporary teeth. Although somewhat more technical, the more accurate terms, primary dentition and secondary dentition, have a good deal to

recommend them for general use. Adequate nourishment is the essential condition of healthy growth. Let us remember that we can only give off energy by the breaking down of the tissues of which we are composed, a literal burning up of ourselves, and that the waste must be restored by nourishment. Now the activities of children are ever so much greater, and are both more general and more continuous than those of adults. Hence, the waste to be restored is by so much the greater.

Then, in addition, the body in every part has to be continuously added to. The life force within cannot build up tissue without food; and in inadequately feeding a child we are asking this impossibility of life. Growth certainly does go on, but into the structure are being built bricks full of flaws, which will crumble and collapse when the stress and strain of life come upon them, and either the whole edifice collapses, or a part or parts give way with the accompaniment of suffering. Upon the primary dentition depends to a very considerable extent the health of a child at that most important time of its life.

Owing to their structure, the primary teeth when attacked by decay are rapidly destroyed, and their important task is imperfectly performed.

In addition to the failure in this particular, decay of the primary teeth causes very severe pain, the effect of which upon the yet unstable nervous system of a child is much greater than would be the case in an older person. And yet the primary teeth are more neglected, if that be possible, than their successors. It is natural that in due time they should be lost, but it is neither natural nor necessary that they should decay. Nor is it necessary that if they do begin to decay they should be neglected. Prevention being better than cure, the fact that *clean teeth never decay* must be borne in mind.

Teeth are meant for use, and the more they are used the greater are their chances; therefore give children food that they can chew. The feeding of children on pap food perpetually does more to damage both teeth and digestion than anything else.

Make brushing and cleaning the teeth a habit as early as possible. By the time the child is old enough to do the brushing by itself the habit should have been established by the constant teaching and care of the mother. When the primary teeth first show signs of decay a dentist should be seen. A simple filing can

be done without frightening the little patient, and not only is the tooth saved and future pain avoided, but the dentist is first known not as a terrible and horrible man who hurts dreadfully, but as a man who has funny things in his room and is an object of interest and curiosity, though perhaps it is too much to expect that the visit should be a pleasure. There is a world of difference between distaste and horror.

About the sixth year of a child's life the permanent teeth, which have been developing in bony crypts below their predecessors, begin to make their appearance above the gum. The first thing that takes place is the absorption of the roots of the primary teeth, either by the action of the white corpuscles of the blood, or by that of other cells specially developed for that purpose. It seems a strange thing that hard material like the roots of teeth should be literally eaten away, but it is not stranger than many other processes that go on in the body. If the primary tooth has been retained in a healthy condition the absorption of the roots is almost complete, and the primary tooth comes away either of its own accord, in eating or from the pressure of the tongue, or it is removed with a very slight effort. Most people who have children know how simple the process is, very rarely requiring the assistance of a dentist; and when that assistance is requisitioned it is most often in those cases where visits are regularly made to insure that things are going on all right.

If, however, the primary tooth has decayed, and the pulp has been destroyed, the absorption of the root is often incomplete; or if the permanent tooth comes up in an irregular position the same may happen, and either the tooth or a piece of it may be retained, and prevent its successor taking its proper place.

A very small amount of care while the permanent teeth are erupting, and the removal of dead primary teeth or parts of them at the right times, is all that is required to allow the permanent teeth to erupt regularly in most cases. Owing to the position of the crypts in which the crowns of the permanent teeth develop, an apparent irregularity very often shows itself; but when one remembers that the roots of the teeth are not then grown, and that the bony socket in which later they are so firmly set only develops round the tooth, it is easy to understand that, provided there is room for the erupting tooth, the pressure of the lips on

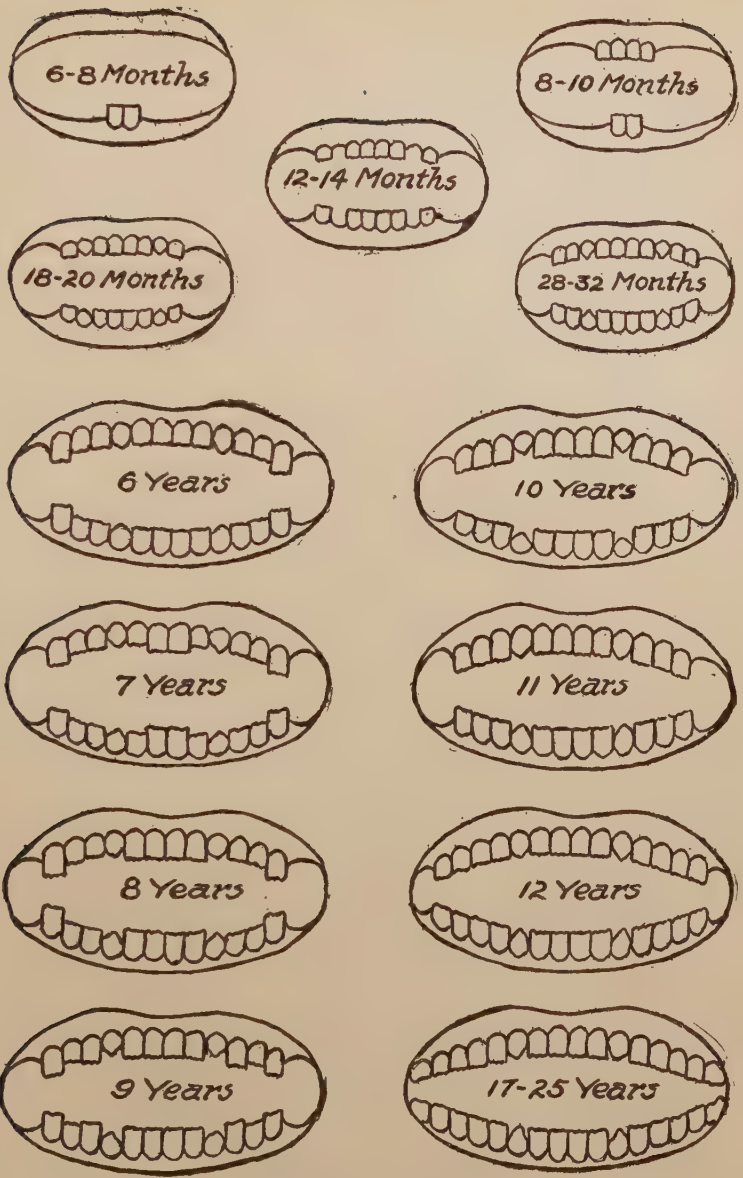
the outside and the tongue on the inside quickly brings the tooth into its place.

It is always a good thing, when the parent has any doubt about the position of a tooth, to consult a dentist when it is erupting. It is a case of a stitch in time saving not nine but nine hundred, as the process of regulating may be a very troublesome one later on. The permanent tooth is much larger than the primary; but the child's jaw has been growing in size, chiefly in the length of the horizontal part of it in which the teeth are placed. The main part of this growth takes place behind the primary teeth, thus making room for the extra number of teeth in the permanent set; but it also takes place in the body of the jaw, as can be seen by the gradual separation between the primary teeth before they are replaced.

The normal times for the eruption of the permanent teeth may be given in tabular form as was done for the primary:

First lower molars	6 years
Lower central incisors	7 "
Upper central incisors	8 "
Upper and lower lateral incisors	9 "
First bicuspids, upper and lower	10 "
Second bicuspids, upper and lower	11 "
Canines	12 "
Second molars	12 "
Third molars	17–24 "

Although the names of the teeth are of no practical importance to the ordinary person, in introducing the name "bicuspid," which has no equivalent among the primary teeth, it might be as well to mention that teeth are described either according to their shape or function. Thus the front teeth are called incisors or cutting teeth. The canine tooth is an obvious reference to shape. The more technical name cuspid also refers to the shape, cusp being, of course, a point. A bicuspid is a tooth with two points, a reference again to shape, while the back teeth are known as molar, which is only a little nearer Latin than the English "miller," the grinder. We do occasionally speak, and quite correctly, of our grinders. Thus the two important parts of the function of the teeth, cutting and grinding of the food, are embodied in names whose apparent technicality is justified, as are many other technical names, by the fact that they are practically



DEVELOPMENT OF TEETH

alike in all languages where the same subject is technically considered.

A word, too, might here be said about the arrangement of the teeth in the jaw, and the relation of the upper to the lower. The upper front teeth are outside of and a little overlapping the lower, so that they act somewhat like the blades of scissors. In consequence of the upper central incisors being so much broader than the lower, they overlap the lower central and part of the lower lateral incisor. Thus the remaining teeth have the middle point of their cutting edge over the meeting-point of two other teeth, each tooth articulating or engaging with two teeth on the opposing jaw. The total result is, of course, to distribute pressure and give larger and more effective grinding or cutting surfaces.

It also has this other effect, that the loss of one tooth means that, for working purposes, two opposing teeth are put as nearly as may be on the unemployed list, which is just about as bad for part of a man as it is for a whole man. There is only one other point in connection with the eruption of the permanent teeth—the most important, and therefore kept to the last.

The first permanent molar comes through behind the temporary teeth at the age of six years. It is very often mistaken for a primary tooth and neglected. Now the first molar is a most important tooth for several reasons. It has the largest grinding surface of all the teeth, and is therefore one whose preservation is specially desirable. A reference to the table will show that the next permanent grinding tooth, the first bicuspid, is not cut until four years later, and the next molar until six years later. During those years, the first molar has to do the largest share of the work of mastication. Where the primary molars are decayed or lost, it has to do practically the whole work; and even under the most favorable circumstances the primary teeth are being shed and their successors come into place gradually, and a very great deal depends upon the first molar if mastication is to be properly accomplished. This is the more necessary because not only is a child growing in bodily stature, but its habits are being formed. Decayed first molars make mastication a painful process. Food is bolted instead of being chewed, and the habit once established is continued with disastrous consequences. Care of children's teeth is probably more fruitful in real and permanent results

from the age of six onward, until the permanent teeth are finally erupted and formed, than at any other period of life.

DISORDERS OF DENTITION

While the process of teething is going on in a healthy infant who is properly fed, the discomfort caused is seldom more than slight and temporary. In infants who are weak and improperly fed, however, the process of dentition is likely to be attended with many disturbances. These disturbances do not necessarily result from teething, for an infant eight months old begins to get peevish and its cry is generally interpreted as denoting hunger. There is then an increase of food and times for feeding until the stomach and bowels are thoroughly upset, and then the physician is summoned to confirm the diagnosis of teething and expected to lance the gums. At the time of teething an infant has been weaned and cow's milk and solid food have been given; a certain amount of gastro-intestinal disturbance is therefore the natural result, which has, however, nothing to do with the fact that the child is teething.

Illustrations of the miscalled disorders of dentition may be multiplied, and they all point to the important rule or caution that an illness should never be attributed to teething until, by means of a careful examination, every other source or cause of disturbance may be safely excluded. The cause of the child's illness may be found in the ear, the throat, the lungs, or the brain, but the seat of the trouble is most frequently in the alimentary canal. The mouth being a part of the alimentary tract, and the teeth and gums being part of the mouth, they therefore share in the general disturbance which is caused by indigestible and irritant matter in the intestines. The cleanliness and disinfection of the mouth ought to receive careful and frequent attention, and it is advisable to clean the mouth thoroughly after each meal with warm boracic lotion and absorbent cotton. The swollen and inflamed gums should be rubbed with lemon juice, which will smart at first to some extent, but afterward it has a soothing and quieting effect.

Lancing the gums will not avail in bringing the teeth and will relieve symptoms only by blood-letting. If it should be impossible to afford relief to the child by other means, the physician

may be justified in making incisions in the gums, but this is a measure which is very seldom needed.

VOMITING

Vomiting in children may be caused from abdominal diseases, but may also be a reflex act from irritation of many other organs.

As an isolated symptom, it is probably due to some irritant in the stomach and will cease when the stomach is emptied. If persistent, and particularly if the vomit be fecal in character (consisting of the contents of the intestine and like a liquid evacuation in appearance and odor), it indicates some obstruction in the bowels and is of serious import.

In infants, the cause is generally overfeeding, or the milk may be too rich. In older children, vomiting, as said before, is usually due to an irritated stomach, and the following treatment may be used with good results:

Diet.—Stop all food until the vomiting has ceased. Then place the child on a very light diet, such as tea and toast, milk and toast, light broths, etc.



Mustard Plaster.—Rub olive-oil, lard, vaseline, or similar substance over the shaded area as shown in the accompanying illustration, and apply over this a mustard plaster, letting it remain for four or five minutes; apply another mustard plaster on the *left side* of the neck over the shaded area as shown in the accompanying illustration.



Lime-water.—This is the best internal drug for the treatment of an irritated stomach. Give about a tablespoonful every three or four hours.

Rhubarb-and-soda Mixture.—Give one teaspoonful of rhubarb-and-soda mixture in a little water.

BILIOUS ATTACKS

This condition is in many instances regarded as being a special development on the part of the child, and it is sometimes traced to hereditary tendency, on the ground that the father, when a boy, was the victim of a similar complaint.

Causes.—The causes of such an attack are various, such as chronic gastro-intestinal catarrh, or a loaded bowel. In other cases, however, it is reasonable to assume that the affected organ is the liver, more or less; that after a period of overwork it has refused to perform its functions normally, or that it is in a condition of acute poisoning.

Symptoms.—The patient, after having been somewhat indisposed for a day or two, is seized with vomiting; the appetite is generally gone; the face becomes pale and sallow and a considerable degree of prostration follows; but all symptoms subside in a day or two and he recovers rapidly.

Treatment.—In the treatment of this affection it is a matter of great importance that the child should not be given any food whatever until the functions of the liver and stomach have been restored by adequate and needed rest. Give water or barley-water freely, but not in large quantities at a time; the medicinal treatment should consist of small doses of calomel, one-half grain three times a day, and when the appetite has returned give weak mutton soup alternately with milk and lime-water.

Prevention.—In order to prevent such an attack it is essential to see that there is no disturbance with the normal action of the liver by the bad and harmful habit of overfeeding, and that indulgence beyond the ordinary diet be allowed only in strict moderation.

DIARRHEA

Definition.—This condition includes watery discharges from the bowel at frequent intervals.

Causes.—Exposure to cold; teething; overexertion. It may also arise in connection with constitutional affection, such as rickets or ulceration of the bowel, and from local irritation. A large number of cases in infancy and early childhood are caused

from improper feeding, overfeeding, too frequent feeding, and impure milk.

Treatment.—The treatment in slight attacks of breast-fed babies consists in diminishing the frequency of the feeding times, or the amount given at each meal. Sometimes, although rarely, the mother's milk does not agree with the child and chronic diarrhea results. If the breast milk cannot be improved upon by treating the mother, it is best to put the baby on some other food.

In the case of bottle-fed babies, diarrhea is often due to an excessive amount of starchy material in the food, in which case it is advisable to add more water to the milk, reduce the number of feedings, and give the child plenty of water to drink. If there is vomiting, with foul stools, all food should be discontinued for ten or twelve hours and a dose of castor-oil given.

The following remedies have been found beneficial:

℞ Subcarbonate of Bismuth . . four drams
Cinnamon-water one and one-half ounces
Mix.
Dose: Three teaspoonfuls every two hours.

Burnt Flour.—One-half teacupful, thoroughly browned in a pan. Add enough hot milk to dissolve the flour; give while warm.

Egg and Nutmeg.—Beat one egg thoroughly and grate into it one quarter of a nutmeg. Sweeten to taste. Repeat every four hours until relieved.

Milk.—Let the child drink slowly a teacupful of boiled milk as hot as possible.

Nothing to stop the movements should be given until the bowels have been thoroughly cleared by a dose of castor-oil.

It is necessary to give a cathartic in these cases, because the bowel movements are usually due to an irritation of the bowel set up by the fermenting food which has not been digested. The diarrhea is nature's method to rid the body of the foreign material.

Diarrhea is a condition which needs immediate attention, because in a short while the child becomes emaciated, and with the general weakness the bowel cannot return to its normal condition. If the child becomes weak from the loss of fluids, it is advisable to increase the fats in the diet during convalescence.

COLIC—STOMACH CRAMPS

Local applications for this trouble are to be placed over the stomach as indicated by the shaded area in this illustration.



Browned Flour.—Undoubtedly the best remedy for checking diarrhea and relieving the pain in colic is the old-fashioned browned flour remedy, which is prepared as follows: brown a tablespoonful of wheat flour in a *dry pan;* stir constantly while on the fire; when brown, add half a pint of boiling milk; stir, and eat while still quite hot.

Nutmeg and Milk.—Add one teaspoonful of ground nutmeg to a glassful of *hot* milk; drink while hot.

Hot Water.—Place a hot-water bag on the abdomen, first having placed a folded cloth between the hot-water bag and the skin, to prevent burning the child.

Turpentine.—Add five to ten drops of turpentine to a pint of hot water. Wring a piece of flannel out of this solution, and apply over the stomach; cover with dry flannel to keep the heat in; or use equal parts of olive-oil and turpentine on the flannel instead of the above solution.

Peppermint-water.—Thirty drops of peppermint-water in a little hot water; drink while hot.

Hot Milk.—Sweeten a glassful of hot milk with a little sugar; drink while hot. Repeat in fifteen minutes if not relieved.

Salt.—Dissolve a teaspoonful of salt in a glass of water; give in teaspoonful doses every five minutes.

Soap-suds Enema.—Usually quick relief is secured by giving an enema (rectal injection) of soap and water.

Ginger.—Twenty-five drops of fluidextract of ginger in hot milk or water, or a tea made from one teaspoonful of ground ginger to a pint of boiling water; the dose of the latter is one to two teaspoonfuls, to be repeated in half an hour if not relieved.

Castor-oil.—If irritant food has been eaten, castor-oil must first of all be employed to clean out the bowels.



Mustard or Red-pepper Plaster.—A large mustard or red-pepper plaster should be placed over the stomach as indicated by the shaded area in the illustration.

For colic with diarrhea, the following are very valuable:

℞ Cinnamon-water three ounces
Subcarbonate of Bismuth .. one ounce
Glycerine one dram
Mix.
Dose: One tablespoonful; if not relieved, repeat in an hour.

A dose of castor-oil is to be given at the same time.

Or:

℞ Ground Nutmeg two drams
Ground Red Pepper two drams
Pulverized Gum of Myrrh two drams
Whisky or Brandy one pint

Mix as follows: Place the above in a quart bottle; cork tightly; let stand for at least a week; shake several times a day; at end of a week or two, strain and bottle for use. The mixture will keep indefinitely and as it is one of the best remedies for pain in the bowels and stomach, it should be kept on hand in every home.

Dose: For an adult, one teaspoonful; for a child ten years of age, one-half teaspoonful; three years of age, ten drops. A saline purgative or castor-oil should be given at the same time.

Or:

℞ Aromatic Sulphuric Acid two drams
Fluidextract of Hematoxylon two drams
Spirit of Chloroform four drams
Syrup of Ginger, to make three ounces
Mix.

Dose: For an adult, two teaspoonfuls; for a child ten years of age, one teaspoonful; five years of age, thirty drops.

DISORDERS OF THE STOMACH

These disorders constitute a class of affections which, for the greater part, arise from diet and feeding. They can, therefore, be prevented by using suitable foods, which must be given with care and in a proper way.

Treatment.—The treatment of these disorders consists mainly in giving temporary rest to the digestive organs, and the diet should gradually be brought to normal as the affected organs recover their tone and strength. While these vital and important facts are generally known to physicians who make a specialty of treating children, it is very much to be regretted that the full import and value is not considered or recognized by the great majority of parents. In treating the various symptoms of indigestion in infants, such as diarrhea, constipation, colic, vomiting, and flatulence, the chief thing to which attention must be given is the diet. This occupies the foremost place in anything like proper treatment.

While it must be admitted that there is in infancy, at times, a peculiarity of temperament with respect to diet, the cases are very few. The stomachs of most infants and children are quite equal to the task of digesting ordinary food, and the common and prevailing forms of indigestion are not the result of hereditary tendencies or of diseases that have been contracted, but are simply due to improper feeding. During infancy the stomach is the source and cause of considerable trouble, and the most prominent symptoms of disturbance in that organ are vomiting and flatulence. When a child belches and brings up the food, it must not be assumed that these acts are necessary results that follow the taking of food, as many mothers and nurses believe. It is essential to the health of the child, as well as a means of preventing many disorders of the stomach, that errors of feeding too fast or too often should be corrected.

The regular vomiting of food after a meal denotes that too much has been taken into the stomach and that therefore the organ has been overloaded. If this should be allowed to become a habit, it will result in causing the stomach to be dilated or expanded. The proper treatment is to reduce the quantity given at each meal, and when there is vomiting one or two hours after a

meal, the cause is likely to be imperfect digestion of the food, which the pylorus will not allow to pass out. If this condition should be allowed to become chronic, it is apt to be accompanied by pain, flatulence, and wasting. The source of the trouble may be in the food, or in some peculiarity in the stomach of the infant.

With these signs of gastric disturbances, or gastritis or gastric catarrh, it is of vital importance that the specific cause should be found before any attempt at treatment is made. The discovery of the cause in the case of breast-fed infants may require an examination, first, of the mother; second, of the breast milk, and third, of the child. As to the mother, it is often the case that a woman will consume an undue amount of some beverage daily while nursing, in the belief that by drinking the beverage she is increasing her nursing power. It is highly important to bear in mind that alcohol is not only valueless as a producer of milk, but it is very likely to cause indigestion in the infant. Try substituting cow's milk for alcohol and the infant will often be enabled to digest the breast milk with satisfaction. If the mother's life be too strenuous a one, as is invariably the case in the well-to-do because of social indulgences, and in the ordinary class because of physical labor, the milk may undergo such changes as to become indigestible. It is advisable that the habits and diet of the mother should be very carefully regulated.

In examining the breast milk it may be found that it is unduly rich in proteids, and if this should be the case the mother should be given a large amount of farinaceous, or floury, as well as vegetable food. The infant should be given a few drams of barley-water before taking the breast. If the milk should happen to contain too much fat, the amount of the mother's food should be materially reduced.

In bottle-fed infants it is necessary first to regulate the quantity and quality of the meals, as well as the number of times the infant is fed. In numerous cases the stomach disturbances will cease when these features have been properly regulated. The milk should not be given in too concentrated a form, for this is a very common fault. Gastric disturbance is also frequently due to barley-water which is not properly prepared, for in some cases whole barley is used and boiled down into a thick mass which is added to the milk.

Milk in too concentrated form and barley are utterly unsuited for infants under nine months old, who cannot by any means digest a quantity of unconverted starch. The barley-water will not only remain undigested itself, but it will occasion so much gastric disturbance as to interfere with the digestion of the milk. Gastric trouble is also very often caused by the use of "infant's foods," although they are more likely to cause intestinal indigestion. Although the practice of giving young infants a taste of what is about to be placed upon the family table may be considered quite harmless, it is advisable not to begin this method of feeding.

CONSTIPATION

Definition.—By constipation is meant the condition in which the bowels do not act with regularity. An infant should have at least two movements a day.

Causes.—In young infants, when bottle-fed, constipation is usually due to a diet containing too much starch, as rice, arrow-root, and sago, and not sufficient fat; also from the use of soothing-syrups.

In older children, especially those of school age, habit exercises the greatest influence; and very often it is continued through adult life, if not checked at an early date.

Symptoms.—The symptoms vary in different children, and also depend on the age. Some children will not show any symptoms, whereas other children become sick after two days without a bowel movement. The usual signs are headache, loss of appetite, occasional vomiting, loss of energy, and slight temperature.

Treatment.—Whatever drug is used should be given regularly, once, twice, or three times a day, in such a dose as will keep the bowels open without purging; and its administration should be continued for weeks or months until the habit of regularity in the action of the bowels has become a fixed one. The time for omission of the drug is to be found by attempting to drop one of the daily doses or to reduce the size of the doses after several weeks of treatment, and if this is found not to alter the regularity of the bowels, the other doses can be gradually diminished or omitted. As a matter of fact it generally becomes evident

after two or three months that the bowels are working so easily and well that there is little risk in reducing and gradually omitting the medicine.

The choice of drugs will differ according to the age of the child. For infants there is one drug which is sanctioned and sanctified by tradition from time immemorial—castor-oil; and we know no drug which is responsible for more chronic constipation in infancy than castor-oil. Let it be remembered that this drug has not only an aperient action but a markedly constipating effect, which follows as an after-effect when a large aperient dose is given, but which is seen more evidently when a small dose, say four or five drops, is given regularly three times a day, when it has no aperient action whatever, but makes the infant very costive. If castor-oil is given, as it often is, as an occasional aperient to an infant with habitual constipation, the effect each time is to open the bowels, and then to make the child costive again, and so the bowel is encouraged in its habit of constipation. There is no better or safer aperient than castor-oil where it is desired merely to evacuate the bowels once, especially if subsequent constipation will be rather an advantage than otherwise, as, for instance, in the case of an infant who has diarrhea from the presence of irritating food in the bowel; but where there is habitual constipation, there could hardly be worse treatment than an occasional dose of castor-oil. For the mildest cases, manna has proved very efficient; a piece the size of a hazelnut may be put in three or four of the feeds daily; but this is of no use for the more severe cases. For these, one of the most reliable drugs is gray powder; this is made up in tablets containing half a grain, and one tablet is given three times a day. If this is not sufficiently strong, a little rhubarb may be added in the following form:

℞ Gray Powder six grains
Compound Rhubarb Powder thirty-six grains
Mix, and divide into twelve powders.
Dose: One powder three times a day.

This prescription is safe for children from two to four months.

The question might be asked whether the use of such powders for several months would not be likely to injure the teeth.

Special attention has been paid to this point, and it has been shown that so far from injuring the teeth, the mercurial seemed, if it had any influence upon them, to act as a preservative, for the teeth of children treated with this drug were often exceptionally good.

For infants over six months of age, if the stools are pale and the child constipated, the following prescription will be found valuable:

℞ Tincture Podophyllum twenty-four drops
Tincture Nux Vomica twenty-four drops
Glycerine one-half ounce
Aniseed-water three ounces
Mix.
Dose: One teaspoonful three times a day, after meals.

When the stools are dry and hard, especially if there is much flatulent colic with the constipation, the saline aperients are good, such as sodium phosphate, of which ten or fifteen grains may be given in two or three of the feeds daily.

For older children the preparations of cascara with malt make an excellent drug for habitual constipation; and preferably those made in liquid form, as capable of accurate measurement, which is very desirable. One of these preparations, given in a dose sufficiently small to allow of its being given three times daily immediately after meals, has the great advantage that it not only acts as an aperient, but also by its diastatic value assists the digestion of starch, which is often at fault in these children. The plain preparations of cascara without malt are more apt to gripe, and are also less reliable in their action.

For children who object to the taste of medicine of any kind, as some will, simply because it is medicine, an infusion of senna pods makes a useful aperient, as it is practically tasteless, and if necessary can be concealed in milk or any liquid food. Three to six pods should be soaked in a wineglassful of cold water for several hours, and the resulting infusion should be given at night.

Petroleum is very successful in some cases. It is given in doses of twenty to thirty drops in an emulsion. Some, however, use larger doses and give it alone.

The following formula is in use:

℞ Liquid Paraffine one-half ounce
Benzoate of Soda twenty-four grains
Powdered Tragacanth twenty grains
Essential Oil of Almonds one drop
Chloroform-water three ounces
Mix.
Dose: One teaspoonful three times a day.

For children with "mucous disease" the decoction of aloes is particularly valuable, as follows:

℞ Citrate of Potash ninety grains
Spirits of Chloroform forty drops
Glycerine one-half ounce
Decoction Aloes Compound four ounces
Mix.
Dose: Two teaspoonfuls night and morning.

In mild cases of constipation sulphur is sometimes very useful; it may be given either as the sulphur lozenges, of which two may be taken every night by a child aged five or six years, or as the confection of sulphur, which may be combined with the confection of senna, half a teaspoonful of each.

A very useful powder to be given every night is powdered rhubarb, five grains; potassium sulphate, five grains.

Whichever of these various drugs are used, it is to be impressed that regularity of the bowels must be procured and maintained, if not by one drug then by another, and that the aim of treatment is to establish a regular habit, and that although it may require several weeks or months of patient perseverance in treatment to do this, it can generally be done; after a time drugs can be reduced in frequency and then in dose, and so by degrees discontinued.

There is yet the use of enemata and suppositories to be considered. On several grounds these are less satisfactory for chronic constipation than treatment by mouth. The action of the bowel is made to depend on local mechanical stimulation in excess of the normal stimulus, and when this has to be repeated frequently for long periods, the bowel is certainly not encouraged to respond to the less powerful normal stimulus, but rather

habituated to the tolerance of accumulated feces, and children even more easily than adults come to rely upon such artificial assistance. Another and very real objection is the dilatation of the rectum and perhaps of the sigmoid which may result from continual use of enemata.

If enemata are to be used at all—and in some cases they are inevitable, for in no other way can the bowel be made to work, while in others they may be necessary occasionally when the daily action from aperients fails—the smallest sufficient bulk of fluid should be used, in order to avoid dilatation of the rectum and sigmoid; for this reason, olive-oil is much preferred to plain soap and water, for whereas six or eight ounces or more of the latter may be required, generally half an ounce of olive-oil with two or three ounces of warm soap and water is quite sufficient. A much smaller quantity of glycerine is effective, but this is to be avoided, for it is a much more powerful stimulus and is therefore more likely to establish intolerance of lesser stimuli; for the same reason, glycerine suppositories are objectionable, but the use of a small piece of soap cut into the shape of a small suppository half an inch long is less open to objection.

Diet.—If the diet of the child is changed to include the juice of fruits, and also vegetables, and the milk changed, there often follows a natural desire to empty the bowels at regular intervals. For older children, the amount of bread is reduced, and green vegetables and oatmeal substituted. Fruit may be given twice a day. Raw scraped apples are especially desirable because of their certain action on the bowels.



Massage.—The purpose of this is to stimulate the action of the intestine by means of muscular contractions. The part shown by the shaded area in the accompanying illustration should be stroked gently at first, and later on deeper pressure may be used. The best method is to rub the deeper part of the abdomen in a circular movement. The fingers are held in one place on the skin so that no friction is caused. Do not massage immediately after food. The massage should be given twice a day and last for about five minutes.

RICKETS

Definition.—Rickets is a disease of childhood characterized chiefly by a softened condition of the bones, and by other evidences of perverted nutrition.

Causes.—This disease is found chiefly among ill-fed children, a starchy diet and indiscriminate feeding appearing to play the chief part in its causation. Want of sunlight and fresh air in the dwellings where the children are reared is also of importance.

The changes that take place in the bones are due to an irregular process of bone formation. The periosteum, the membrane enveloping the bones, becomes inflamed, and in consequence the bone formed beneath it is defective in lime salts and very soft. At the growing ends of the bones there is an even more striking change. The epiphysial plate of cartilage, from which growth takes place, is much thickened, the cellular elements in it much increased in number, and the bone which it produces markedly deficient in lime salts. The new bone shows a deficiency of lime amounting to twenty-five or thirty-five per cent., and this, too, notwithstanding the fact that there is abundance of lime in the body, as shown by its excessive excretion in the urine.

Symptoms.—Although rickets may have its origin during intra-uterine life, it is seldom that it can be recognized until several months after birth, and it most commonly attracts attention at about the end of the first year. It rarely appears for the first time after the age of five is reached. The symptoms which precede the outward manifestation of the disease are marked disorder of the digestive and alimentary functions. The child's appetite is diminished, and there is frequent vomiting, together with diarrhea or irregularity of the bowels, the evacuations being clay-colored and unhealthy. Along with this there is a falling away in flesh. Bronchitis is also a very common symptom, and often the first to attract the parents' attention. Convulsions in young children are sometimes a symptom of rickets, as is proved by their disappearance under the treatment appropriate to this disease. At the same time there is great tenderness of the bones, as shown by the pain produced on moving or handling the child. The urine contains a large amount of lime salts. Gradually the changes in the

shape of the bones become visible, at first chiefly noticed at the ends of the long bones, as in those of the arm, causing enlargements at the wrists, or in the ribs, producing a knobbed appearance at the junction of their ends with the rib cartilages. The bones also, from their softened condition, tend to become distorted and misshapen, both by the action of the muscles and by the weight of the body resting on them. Those of the limbs are bent outward and forward, and the child becomes "bow-legged" or "in-kneed," often to an extreme degree. The trunk of the body likewise shows various alterations and deformities, owing to curvatures of the spine, the flattening of the lateral curves of the ribs, and the projection forward of the breast-bone. The cavity of the chest may thus be contracted and the development of the thoracic organs interfered with as well as their functions more or less embarrassed. The pelvis undergoes distortion, which may reduce its capacity to a degree that in the female may afterward lead to serious difficulties. The head of the rickety child is square and large-looking in its upper part, the individual bones of the cranium sometimes remaining long ununited, while the soft "fontanelle" on the top of the head remains unclosed long after the end of the second year, the time at which it should have disappeared. The face is small and ill-developed, and the teeth appear late and fall out or decay early. The constitutional conditions of ill-health continue, and the nutrition and development of the child are greatly retarded.

Preventive Treatment.—The treatment of rickets is necessarily more hygienic than medicinal, and includes such preventive measures as may be exercised by strict attention to personal health and nutrition on the part of mothers, especially where there appears to be any tendency to a rickety development in any members of the family. Very important also is the avoidance of too prolonged nursing, which not only tends directly to favor the development of rickets in the infant nursed, but by its weakening effects upon the mother's health is calculated to engender the disease in any succeeding children. When the mother is healthy, her milk abundant, and nursing discontinued before the lapse of the first year, there is no better means of preventing the occurrence of rickets than this natural method of feeding an infant; the disease, as is well known, being far more frequently met with in children brought up by hand. The

management of the child exhibiting any tendency to rickets is of great importance, but can only be alluded to in general terms. The digestive disorders characteristic of the setting in of the disease render necessary the greatest care and watchfulness as to diet. Any one system of feeding the infant may at times be found to disagree, and may require to be changed or modified in some particulars. Thus, if the child be not nursed but fed artificially, milk, either fresh or condensed, should be the only article of diet for at least the first year, and the chief element for the next. When not digested well, as may at times be shown by its appearance as a curd in the evacuations, it may be diluted with lime-water, or else discontinued for a short time, carefully made gruel or barley-water being substituted. Bread should not be given to the child, and, what is still more important, he should not have scraps from the general table. Many of the so-called "infant's foods" which are now so extensively used appear to be well adapted for their purpose, but when employed too abundantly and to the exclusion of the due amount of milk, are often productive of digestive and intestinal disorders, probably from their containing a greater amount of sugar than can be utilized. From the end of the first year, light animal soups or lightly boiled eggs may occasionally be given with advantage.

Medicinal Treatment.—The medicinal remedies most to be relied on are those which improve the digestive functions and minister to nutrition, and include such agents as the preparations of iron, quinine, and especially cod-liver oil. The administration of lime salts in large quantity has been proposed by some physicians under the idea that in this way the deficient earthy matter might be supplied to the bones, but little if any success can be claimed for this plan, and it is generally recognized that the most useful method of treatment is that which is directed to the feeble assimilative powers, and seeks to supply food of a kind which will be both readily digested and nutritious. Of no less importance, however, are abundance of fresh air, cleanliness, warm clothing, and attention to the general hygiene of the child and to regularity in all its functions.

When the disease is showing evidence of advancing, it is desirable to restrain the child from walking, as far as possible. But this precaution may be to some extent rendered unnecessary by the use of splints and other apparatus as supports for the

limbs and body, enabling the child to move about without the risk of bending and deformity of the bones, which otherwise would probably be the result.

The following will be found beneficial:

℞ Calcium Hypophosphite one teaspoonful
Emulsion Cod-liver Oil eight ounces
Mix.
Dose: One teaspoonful three times a day, after meals.

Although it is rather difficult to apply ordinary methods to the small chest of an infant, yet much good is done by friction with a stimulating liniment, and for this purpose the following is highly recommended:

℞ Turpentine Liniment one ounce
Belladonna Liniment one dram
Sweet-oil one ounce
Mix.
Directions: To be rubbed on the chest twice a day.

INFANTILE SCURVY—SCORBUTUS

It has been authoritatively stated that more than seventy-five per cent. of the cases of scurvy that occur during the entire period of childhood take place between the sixth and the twenty-fourth month, and from this circumstance the designation "infantile scurvy" is peculiarly appropriate. It is important to bear in mind the following facts regarding the causes of scurvy.

Causes.—This is a disease of deficiency and not of excess. The deficiency consists in the lack of a sufficient amount of the anti-scorbutic element in the food which constitutes the diet, and the absence of this element against scurvy has been going on for a very protracted period. Although the specific element is not known, the foods which contain it are. The anti-scorbutic element is found in greatest abundance in fresh food, especially in fruits and vegetables, and the farther one gets from fresh food as the regular diet, the greater is the tendency to scurvy. Lastly, there is a class of foods specially prepared for infants, in which, while they are being prepared, the anti-scorbutic element has been completely destroyed.

Symptoms.—As regards the important features of this affection, hemorrhage may take the form of bleeding at and around the epiphyses or bulky extremities of the long bones, causing a painful, tense swelling of the membrane beneath the covering of the bones. Bloody urine may be the only sign, and this is especially likely to occur in the case of infants under one year old.

Bleeding and sponginess of the gums are possible after the period of teething has commenced, and hemorrhage may occur about the cavity of the eye, in the skin, from the nose, or from the bowel. The children are usually anemic, sometimes in a very marked degree, and the bloodless condition becomes worse by extensive hemorrhages such as those connected with the long bones. The infants are frequently more or less apathetic and listless; they are disinclined to move the limbs actively, and sometimes develop a condition which resembles paralysis in the limbs.

Preventive Treatment.—As regards the preventive treatment of this affection, it may be briefly stated as comprising a fresh-food diet of suitable quantity as well as quality, and adapted to the age of the child. Cow's milk must of necessity be fresh and must not undergo any change by prolonged boiling or pasteurizing, as many cases of scurvy have been traced to sterilized or pasteurized milk. This risk has been increased in recent years by the action of several of the large dairy companies which are supplying pasteurized milk to all their customers without giving any notice whatever that the milk has been treated in such a manner. When many of the customers proceed to boil the milk after it has been delivered, the main nutritive element which it contains will be in an extremely thin condition by the time the milk has reached the child. While the danger is materially increased by prolonged sterilization and pasteurization, the ordinary domestic method of allowing the milk to come to the boiling-point is probably free from harm. Sometimes scurvy is brought on by over-diluting the milk, and this is a fact worthy of being kept constantly in mind.

The saying goes that one quart of milk contains as much citric acid as an orange, and this citric acid is regarded by many persons as the anti-scorbutic element. If, however, an infant should receive only one quarter or one half of a pint of

milk daily, the quantity of anti-scorbutic substance left may be so small that scurvy finds a favorable opportunity to develop. It is, therefore, necessary to see that there is a sufficient quantity of fresh milk in the diet. It may also be profitable to state with respect to this malady, that it frequently develops as the result of the prolonged use of some special food which has been ordered for curing another affection; thus, on account of some form of indigestion an infant might have been put on peptonized milk, and after some months of this diet scurvy is the unavoidable result. Further, it may be that some kind of condensed milk has been used for gastro-intestinal disturbance, and some months later scurvy makes its appearance. It is also very important to remember that predigested milk and condensed milk are likely to bring on scurvy, if used as the only diet for any length of time.

All writers on scurvy have been unanimous in regarding the cause of scurvy to be the diet which consists of condensed milk or other patent "infant's food," as invariably scurvy appears subsequently to the employment of such a diet. Some of these foods are more frequently associated with scurvy than others, but this closer relation of certain foods to the disease is due, first, to the larger sale of the food; or second, to its use during the earliest months of life; or, third, to its exclusive use without the addition of any fresh milk.

It is becoming more evident every day that these foods that are prepared artificially cannot be relied on in the feeding of infants. In the treatment of scurvy they must be discarded entirely and permanently excluded from the diet. as it is practically impossible to limit their use so as to render them harmless. Scurvy is less common after the age of two years, because part of the diet consists almost invariably of fruits and vegetables. It is very rare that an actual and settled dislike for fruits and vegetables in any form is found in children, but if there is positive dislike for fruits and vegetables, such dislike should, by all possible means, be overcome.

Curative Treatment.—In the curative treatment of scurvy the plan to be adopted must be identical with that followed in the treatment for the prevention of the disease. In the case of infants fresh milk must, of course, be given, and if an immediate effect be desired, it must not be treated by means of heat. Raw

meat juice will be found to be of excellent service for the anemia which usually exists. While this article has no great value as against scurvy, that is to say, its anti-scorbutic value is inconsiderable, it is, however, very easily retained and digested.

An infant of twelve months may be given half an ounce of expressed meat juice every day in divided amounts and well diluted with milk and water. Fresh fruits and vegetables must, however, constitute the more special part of the dietetic treatment; the following list embraces the most useful and valuable: oranges, grapes, potatoes, lemons, and cabbages. Half an ounce of the juice of oranges or grapes may be given in water, three times a day, to infants under one year. In the case of older children, however, an exceedingly effective anti-scorbutic consists of boiled potato mixed with milk. The potato should be boiled in its skin, and the floury part just beneath the skin should be scraped off and beaten up thoroughly with enough milk to make a smooth cream, sufficiently thick to pour out rather heavily (about two heaping teaspoonfuls of potato to one ounce of milk). One and one-half to two teaspoonfuls of this potato cream are given three or four times a day; after two or three weeks the dose is gradually reduced.

For children whose power of digestion is weak, the plan most suitable is to administer the vegetable juices through the medium of beef tea or chicken broth in which potatoes and carrots have been boiled and strained off. It is, however, very important to bear in mind that the infant's digestive powers must not be taxed unduly, therefore the amount of fruit or vegetables must not be such as will overtax the child's digestive powers, for the result will assuredly be flatulence, diarrhea, and other similar conditions.

The prompt beneficial effect of this treatment constitutes one of the signal triumphs of curative medicine, for marked improvement is very often observed within two days, and recovery from acute symptoms within several days, provided the disease has not advanced too far. The child begins to show signs of brightness; he takes milk regularly and with relish; the hemorrhages are at an end; the swelling of the gums subsides; the tenderness in the limbs is considerably less; and the anxious look expressing fear of movement when an attendant is approaching is entirely absent.

The necessity for moving and handling the infant as little as possible is obvious; the pain caused by pulling on socks, shoes, etc., as well as by bathing, is so evident that it is only humane to have the infant wrapped in loose clothing and allow him to lie undisturbed as much as possible.

CONGENITAL PYLORIC STENOSIS

Definition.—This condition is an unnatural narrowing of the opening of the stomach at the commencement of the duodenum, or first part of the small intestine, beginning at the pylorus. It is an affection of early infancy, existing at birth, and in consequence of constant neglect in many cases, and lack of proper treatment, the infants usually die.

Symptoms.—The symptoms are generally very clearly and distinctly manifested, making an early diagnosis quite easy. The following is the usual history: An infant, perfectly healthy at birth and apparently progressing quite well for two, three, or even five weeks, suddenly begins to vomit. The vomiting continues persistently, whether the food be breast or artificial, with the result that the food is frequently changed on suggestion, and in this way various diets are given to the infant. While change of diet may check the vomiting for a short time and afford temporary relief, it frequently happens that this relief lasts only one day, or one week. The fact that the vomiting ceases makes it reasonable to conclude that the disturbance was due to improper nourishment and that it is essential to procure peculiarly appropriate food. All this, however, is a radical mistake, and is seriously misleading, for the reason that any food given yields the same result. This treatment is marked by a train of failures, and the child ultimately dies.

The vomiting is nothing else than a flowing back of the food without any signs of nausea, gastric catarrh (catarrh of the stomach), or acute disease. At the beginning the vomiting is quite moderate in amount, occurs occasionally, and is not at all violent. In course of time, however, the quantity increases and represents two or three feedings. In addition, the violence is quite marked, so much so that the food is virtually driven through the mouth and nose for some distance. Food that is partly digested is the only thing brought up, and although only

the last meal is sometimes rejected, at other times there is every evidence that the quantity in question represents several meals.

The trouble lying at the bottom of cases of this kind is a hypertrophy, or enlargement, of some organ; probably this has been existing since birth. This form of hypertrophy is very likely to be of any one or of all the muscular layers of the pylorus.

It is important to bear in mind that the chief factor is the spasm of the pylorus, for the reason that the food is unable to pass the pylorus on account of the spasm.

The order of events appears to be gastric juice irritation, pyloric spasm, and hypertrophy or enlargement and dilatation of the stomach, owing to its efforts in forcing the food through the pylorus. The vomiting is brought on by the irritation of the stagnant contents of the stomach, and sometimes by the large amount of food that accumulates there.

Treatment.—The best course of treatment to pursue is still an unsettled question. At first it was thought that an operation was the only means to effect a cure, and this view is still maintained by many eminent and distinguished physicians and surgeons. On the other hand, some physicians have found it possible to afford relief from the symptoms described, and to eventually bring about recovery, through purely medical measures. In so far as the present knowledge of the profession is of any assistance, the course of treatment most recommended is that on the basis of medicine, and, in the event of failure, operative measures may be resorted to. Special care must be taken, however, to make sure that the infant is not too weak to be placed in the hands of a surgeon. The most important medical means to be employed consists of proper and suitable feeding. No food is to be compared with breast milk, provided the quality is normal and does not contain excess fat. The quality of the food should be determined by chemical examination, and should it be found necessary, the mother's diet can be so altered as to bring her milk to the proper standard.

Breast milk should not, under any circumstances, be set aside and discarded until all possible efforts have been made to use it to advantage and with success. In this affection, fresh milk from the cow, as commonly used during infancy, is not as a rule suitable, at least for some time. A substitute must therefore be

used in which the caseine is more digestible and which contains a small amount of fat. A very excellent substitute is whey. It is possible to maintain life by the use of certain foods which are not complete in themselves but which the stomach can very easily digest, such as malted milk. In fact, whatever the diet may be, the food must be given well diluted at first and strengthened gradually as the stomach shows signs of being able to endure and retain it. It is a very good plan to use either weak whey or peptogenous milk alternately with one of the foods above mentioned. In the event of the child's appetite being very good and more than the normal quantity of food required, sugar in the form of malt extract may be given, as it is very digestible. A little orange or grape juice may also be given in water. To insure thorough digestion of the food received in the stomach, the quantity given at any one time should be very small, but the meals must be given more frequently. If the vomiting continues, the quantity given should be reduced.

It will often be found necessary to feed the child every two hours during the day and night, though sometimes much better results can be obtained by feeding it every hour during the day. Experience in individual cases will, however, be the safest guide in determining both the quantity and frequency of the feedings. It must not be forgotten that the process of fattening is a slow one, nor that every attempt to increase the fatty element in the diet is often followed by disturbances of the stomach and an increase of pyloric spasms.

In pyloric stenosis more difficulties are encountered in the course of dietetic treatment than in any other affection peculiar to children. Washing out of the stomach is of essential assistance in the dietetic treatment. This, of course, must be done by an experienced physician, and though once a day is usually quite sufficient, twice a day will be found very beneficial in severe cases.

Irritation is materially allayed and digestion considerably improved by the complete removal of all irritating food, through washing out of the stomach. The nature and amount of food removed from the stomach will furnish the means for determining whether the food is digestible or not, and will also afford an opportunity of deciding on the best course to pursue. If the vomiting should cease, improvement is evident, and this may be

observed by the increased comfort of the child, in the healthy evacuations, which occur naturally, and in the disappearance of the marked movements of the stomach. It may be necessary to continue the treatment for some months, even in favorable cases, although the strength of the food can be gradually increased and the stomach washed out less frequently.

Small doses of opium have been strongly recommended to reduce the pyloric spasm, but it is the opinion of an eminent and widely experienced specialist that neither opium nor bromide of potassium has proved useful in any degree. The tissues shrivel up, and this shows the need of water, hence thirst is often a very marked feature. Inasmuch as water in sufficient quantity cannot always be supplied by the mouth, it may be given by means of saline injections by the rectum. If from one-half to one pint is given each day, the comfort and nutrition of the child will be greatly improved. These measures, it is needless to state, must be carried out by a physician.

If the symptoms should not be definitely relieved and the child's nutrition not maintained by dieting and washing out of the stomach, an operation seems the only ultimate resort in which to obtain any satisfactory result. As the operation is a severe and dangerous one, the death-rate is rather high, and an operation of this sort does not by any means put an end to the difficulty of feeding.

CHRONIC INTESTINAL INDIGESTION—MARASMUS

Definition.—Marasmus is a gradual wasting of the tissues of the body from insufficient or imperfect food-supply. The disease affects the young of both sexes.

Causes in Infants.—As this condition affects infants, it may be stated that in the case of breast-fed infants chronic gastro-intestinal indigestion is not at all a common affection, except from absolute and wanton neglect of the rules of feeding. In the case of bottle-fed babies the condition is, however, a very common one, and may necessitate much patience in the treatment. Over-feeding is the principal and invariable cause of chronic indigestion in babies. It is the general tendency, whenever the baby cries, to conclude that he is hungry and to give him more food, and even if he should vomit up the food it is still

believed that it is necessary to make up the loss, therefore more food is given; and it is not at all to be wondered at that the child does not thrive, but rather that he actually survives such an experience.

One of the chief causes of intestinal trouble in infancy is the use of condensed milk and proprietary "infant's foods." These foods are easily prepared, and as they stay down, as a rule, without much difficulty, and do not seem to show any signs of ill effect, they are, by many mothers, preferred to fresh foods. The infants apparently thrive on them for a time, become fat and sleek, and are the objects of admiration. These foods are, however, in many cases, not suited to the digestive powers of an infant, and as they are largely composed of sugar and starch, they tend to ferment in the intestine, so that flatulent indigestion is the common and invariable result.

Symptoms in Infants.—The power of digestion which has broken down from overstrain causes the infant to waste. He becomes restless and fretful, sleeps badly, has colicky pains, vomiting, flatulence, diarrhea, or constipation, and offensive stools with mucus or undigested milk are the common and invariable accompaniments. Practically all cases of marasmus are accompanied by signs of rickets.

Treatment in Infants.—The first step to be taken in the treatment of these cases is to discard the patent food entirely and return to the normal and natural feeding, which is the best and safest. The freshness of the milk, the cleanliness of the feeding-bottles, the amount of diluent or the substances used for diluting, cream and sugar used, the temperature of the milk, the number of times the meals have been given, the time that a meal consumed, the state of the appetite, must all be taken into consideration, so as to detect any error which may have given rise to the indigestion or kept it up. When there is chronic gastro-intestinal catarrh, which does not yield to simple treatment or diet, or which is in an advanced stage, it is advisable to modify the ordinary feeding and the milk may be even further diluted. One part of milk may be mixed with two or three parts of lime-water and given in small quantities every two hours during the day and every four hours during the night. In some cases it will be advisable to give nothing but lime-water during the night, so as to rest the alimentary tract to a greater extent.

As the stomach retains better and better, the strength of the milk mixture may be gradually increased. In other cases the citrate of soda method will be found very serviceable. This method consists in adding citrate of soda to the milk, say one or two grains to each ounce of milk in the mixture as it is diluted for use. The curds which are formed in the stomach are rendered more digestible and the vital properties of the milk are by no means injured. It may be necessary to employ special means to overcome the indigestible feature of the proteids of cow's milk, and for this purpose few things, if any, are better than whey. This mixture is prepared by adding one dram of liquid rennet to half a pint of warm milk. After the mixture has been thoroughly stirred, it must be allowed to stand until it is firmly coagulated or formed into clots. The curd is then broken thoroughly and the whey is strained off through muslin or a strainer.

When whey is kept for any length of time, or is to be mixed with other food, it is advisable to heat it to 160° F., so as to destroy the rennet ferment. Begin with equal parts of whey and water and give small quantities every two hours during the day. As the youngest infants usually digest whey, the strength of the food can be increased by giving it undiluted, then by adding some sugar or malt, and later cream. The proteid element in the diet may be increased by the addition of from ten to fifteen drops of raw meat juice or white of egg to each meal or alternate meal.

The difficulty which infants have in digesting the milk albumins may also be met by the use of peptonized milk. This may be done by pancreatic extract, or by peptonizing powders, or by peptogenic milk powders, and each packet gives directions as to the method of preparation. The last named article is the most suitable for young infants, as the product resulting from the preparation bears a very close resemblance to breast milk in its chemical composition. It is advisable not to prolong the peptonizing process beyond half an hour, and whole milk without any extra cream should be employed. While infants take and digest peptonized milk quite well, its nutritive properties are, however, quite inferior to those of fresh milk. As the digestion improves, the time given to the process of peptonizing should be gradually reduced from thirty to twenty and to ten minutes.

In the case of infants under six months, it is not at all advisable to give starchy foods for digestive troubles, but after that age has been passed they may be found useful occasionally, possibly owing to their mechanical action in reducing the curds. A tablespoonful of flour or barley or oatmeal or wheat boiled in a pint of water for an hour may also be used, and half an ounce to an ounce of this may be mixed with an ordinary feed of milk and water. It is necessary at the beginning of the treatment not only to decide with respect to the food, but to give it a fair trial. The effect will not be noticed at once, and there is likely to be no improvement if the food should be varied every few days, for a period of one week or ten days at least is necessary to make a proper test in order to see the true effect.

At the same time it is a very good plan to combine two of the methods, as, for example, give a diet of peptonized milk during the day and one of whey during the night. Both of these preparations are intended for the same purpose, and that is, to reduce the amount of proteid digestion in the stomach, and it may be possible to tell from the symptoms which is most effective and thus decide on a definite and invariable course of action.

The stomach and bowels may also be aided in recovering their tone by varying the diet a little, and to this end the degree to which the food may be diluted is probably of more importance than the food itself. The digestive powers are weakened and inactive, hence only the weakest foods will be digested, so that the most beneficial foods may prove utterly useless merely because they are too strong. While these facts are true, the stomach must not be flooded with large quantities of fluid food. It is far better to give small amounts frequently than larger quantities less often, and it is best to begin with from one to two ounces every two hours. It is not always easy to know whether the food is agreeing with the infant or not. When whining and restlessness have ceased and there is a return of smiling, and longer and quieter periods of sleep, the child may be regarded as on the way to improvement, for these are very favorable signs.

The subsidence of the active gastro-intestinal symptoms, such as colic, flatulence, and other kindred ills, as well as an improvement in the quality of the excrement, are also decidedly favor-

able indications. As the diet in the early stage is one intended to give rest to the alimentary tract and not to fatten the infant, a gain in weight must not be expected at once. The nutrition of the infant will not improve until all the active symptoms have subsided and a more nourishing diet has been adopted.

In the early stages, also, it is absolutely necessary to reduce the amount of fat to the lowest quantity, because it is undigestible. In the convalescent stage, however, cream and cod-liver oil are extremely serviceable in building up the child. The length of time that the special feeding should last will depend upon the mildness or severity as well as the duration of the illness. It must not be forgotten that, however useful these methods are as temporary means, they should not be prolonged further than is necessary, as great risk is incurred by doing so. The infant should, therefore, return as soon as possible to fresh cow's milk and other substances suitable to its age. It is almost superfluous to state that the return to normal diet must necessarily be done gradually, by introducing one or two feedings of fresh milk in the course of the day.

Marasmus is the name given to the extreme form of malnutrition due to gastro-intestinal catarrh. Some infants are born with a very low vitality and with an alimentary tract which is seemingly unequal to the task which is imposed upon it by any form of food, but such cases are comparatively rare and quite exceptional. In the great majority of patients affected with marasmus, the underlying causes are improper food and feeding. The vital powers of the child may be at the lowest possible ebb before medical aid has been sought, and the diagnosis which is then made shows tuberculosis of the mesenteric glands. This condition is, however, very rare in infants.

If the methods of feeding already described and recommended should fail, the best procedure is to obtain the services of a wet-nurse. If the infant should be too weak to take the breast, draw off the milk and give it with a spoon; but if a wet-nurse cannot be procured, then the only elements on which reliance can be placed for a time are brandy and meat juice. Mix one dram each of brandy and fresh meat juice with six ounces of water, and give one ounce of this mixture every hour to an infant three months old, so that during twenty-four hours eighteen feedings will be given. Instead of the meat juice weak chicken or veal

soup may be used, and after having tried this for a few days, give some whey or peptonized milk occasionally, and endeavor to get the digestion in normal condition.

There is yet another mixture which may be tried with much satisfaction, and that is composed of two drams of white of egg, one dram each of brandy and malt extract, and six ounces of water. Give one ounce every hour to an infant three months old, so that during twenty-four hours eighteen feedings will be given.

When the mucous membrane of the alimentary tract has become atrophied—that is to say, has been wasted, and this is of frequent occurrence—and therefore cannot perform its functions, there is no satisfactory result from the treatment. In addition to the measures of diet, the infant affected with this disease must be kept warm and clean and must also have an abundance of fresh air. If vomiting, colic, and flatulence should be persistent, other treatment than that of diet will be necessary. When vomiting continues notwithstanding the carefully regulated diet, it is more than likely that there is in the stomach some portion of food left which the pylorus has not allowed to pass out. Food that remains in the stomach is quite likely to decompose and is not only apt to irritate the mucous membrane but also to cause spasm of the pylorus. The best treatment for this condition is the washing out of the stomach once or twice, which, of course, must be done by a physician. The process is a very simple one in the case of babies, and can usually be carried out without causing any disturbance. The required apparatus is a No. 10 or No. 12 soft rubber catheter, with a few feet of rubber tubing; the two must be connected by a glass rod, and a small glass funnel fitted to the other end of the rubber tubing.

Causes in Older Children.—It is particularly prevalent in large and populous cities, where children are deprived of ready access to exercise in pure air, and sicken and pine; or when they are confined in crowded and airless schoolrooms. Children who are employed in manufactories, where their occupation and confinement are such as to weaken and enervate them, are also liable to be attacked with this disease. Irregularity in diet and improper food likewise give rise to marasmus. It prevails most commonly in autumn, the season which affords opportunity for eating unripe fruit and vegetable articles.

Symptoms in Older Children.—A sluggishness, lassitude on slight exertion, depravity and loss of appetite, wasting of the flesh, fullness of the features and paleness of the countenance, swelling of the abdomen, an irregular and generally a costive state of the bowels, a change in the color and odor of the feces, fetid breath, swelling of the upper lip and itching of the nose, mark the beginning of the disease. When these symptoms have continued for some time, they are followed by alternate paleness and flushings of the countenance, heat and dryness of the skin, feeble and quick pulse, thirst, fretfulness, increasing debility and disturbed sleep, during which the patients grind or gnash their teeth and are subject to involuntary starting and twitching of different muscles. Every case of marasmus does not necessarily include all the symptoms enumerated. Different combinations of them give a variety of the disease which is, however, in general, readily known and distinguished. Marasmus appears most commonly among weak and infirm children, whether they are so from delicacy of constitution or from incidental causes.

Treatment in Older Children.—The child should be kept on a vegetable and milk diet.

Salt Water Baths.—A tepid salt water bath given every day or two is often of great value in toning up the whole system.

The following tonic has also been found beneficial in building up the system:

℞ Cod-liver Oil four ounces
Syrup of Iodide of Iron one dram
Lime-water, to make six ounces
Mix.
Dose: One to two teaspoonfuls, three times a day.

MEASLES—RUBEOLA—MORBILLI

Definition.—Measles, also known as morbilli or rubeola, is an acute infectious disease occurring mostly in children. It is only within a comparatively recent period that measles has come to be universally regarded as a distinct and independent malady. The disease known as German measles, or Roetheln, is still slighter than measles, though the former is probably often mistaken for true measles.



From Kingsbury Dermachromes, by permission of Rebman Co., N. Y.

MEASLES

Causes.—Measles is a disease of the earlier years of childhood. Like other infectious maladies, it is admittedly rare, though not unknown, in nurslings or infants under six months old. It is comparatively seldom met with in adults, but this is largely due to the fact that most persons have undergone an attack in early life, or have been repeatedly exposed to the infection of measles and so have probably acquired a certain amount of immunity; for, among communities where measles is not prevalent, the old suffer equally with the young when infection is once introduced. Some countries enjoy long immunity from outbreaks of measles, but it has been frequently found that in such cases the disease, when introduced, spreads with great rapidity and virulence. In these cases the great mortality is perhaps in part due to complications produced by overcrowding and unsanitary conditions, the absence of nursing, and the fear caused by a new disease, but it is generally held that epidemics arising in what may be termed a virgin soil are apt to possess an innate severity.

In the United States measles is rarely absent, especially from large towns, where sporadic cases are found in greater or less number at all seasons. But every now and then, especially in the months of June and December, epidemics arise, and spread among the children who are not protected by a recent attack. One attack of measles does not give complete immunity from future attacks, though, as stated above, there is a certain amount of protection, and second attacks are rare.

There are few diseases so infectious as measles, and its rapid spread in epidemics is no doubt due to the fact that infection is most potent in the earlier stages, in the first three days even, before its real nature has been shown by the appearance of the rash. Hence the difficulty of timely isolation and the readiness with which the disease is spread. Another fact which sometimes assists the spread of measles is that the temperature often falls to normal on the second day and the child appears to be much better, so that it is again allowed to mix with its playfellows, owing to the mistaken idea that it is suffering merely from a cold, till the rash appears on the fourth day and shows the real nature of the malady. It is possible also that infection may be carried from one place to another by clothing, toys, etc., although the tenacity and activity of the infective agent is, in this respect, much less marked than in the cases of scarlatina and smallpox.

Of the nature of the infecting agent nothing definite is known, though recent investigations into the cause of other infectious forms of disease make it probable that this is of a bacterial nature.

Symptoms.—Like the other eruptive fevers (exanthemata), to which class of diseases measles belongs, its progress is marked by several stages more or less sharply defined.

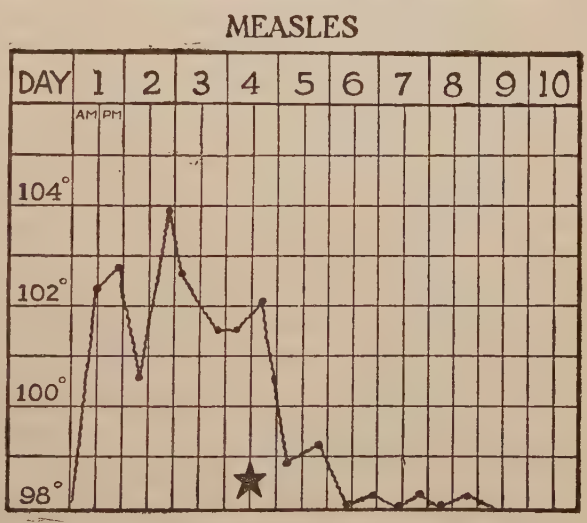
After the infection has been received into the system, a period of incubation or latency precedes the development of the disease, during which scarcely any disturbance of the health is perceptible. This period appears to vary in duration, but it may be stated as generally lasting for from ten to fourteen days, when it is followed by the invasion of the symptoms specially characteristic of measles. These consist in the somewhat sudden onset of acute catarrh of the mucous membranes. Sneezing, accompanied with a watery discharge, sometimes bleeding, from the nose, redness and watering of the eyes, cough of a short, frequent, and noisy character, with little or no expectoration, hoarseness of the voice, and occasionally sickness and diarrhea, are the chief local symptoms of this stage. But along with these there is well marked febrile disturbance, the temperature being elevated (102° to 104° F.) and the pulse rapid, while headache, thirst, and restlessness are usually present to a greater or less degree. In some instances, however, these initial symptoms are so slight that they almost escape notice, and the child is allowed to associate with others at a time when, as will be afterward seen, the contagion of the disease is most active. In rare cases, especially in young children, convulsions usher in, or occur in the course of, this stage of invasion, which lasts as a rule for four or five days, the febrile symptoms, however, showing some tendency to undergo abatement after the second day.

On the fourth or fifth day after the invasion, sometimes later, rarely earlier, the characteristic eruption appears on the skin, being first noticed on the brow, cheeks, chin, also behind the ears, and on the neck. It consists of small spots of a dusky red or crimson color, slightly elevated above the surface, at first isolated, but tending to become grouped together into patches of irregular, occasionally crescentic, outline, with portions of skin free from the eruption intervening. The face acquires a swollen and bloated appearance, which, taken along with the catarrh of

the nostrils and eyes, is almost characteristic, and renders the diagnosis at this stage a matter of no difficulty. Even before it appears on the skin, the rash is sometimes visible within the mouth as bluish-red spots on the mucous membrane. The eruption spreads downward over the body and limbs, which are soon thickly studded with the red spots or patches. Sometimes these become confluent over a considerable surface, giving rise to a larger area of uniform redness.

The rash continues to come out for two or three days, and then begins to fade in the order in which it first showed itself, namely, from above downward. By the end of about a week after its first appearance, scarcely any trace of the eruption remains beyond a faint staining of the skin. Occasionally during convalescence slight peeling of the epidermis takes place, but much less frequently and distinctly than is the case in scarlet fever.

At the commencement of the eruptive stage, the fever, catarrh, and other constitutional disturbance, which were present from the beginning, become aggravated, the temperature often rising to 105° F. or more, and there are headache, thirst, furred tongue, and soreness of the throat, upon which red patches similar to those on the surface of the body may be observed. These symptoms usually decline as soon as the rash has attained its maximum, and often there occurs a sudden and extensive fall of temperature, indicating that the crisis of the disease has been reached. In favorable cases convalescence proceeds rapidly, the patient feeling perfectly well even before the rash has faded from the skin.



Temperature chart.

Treatment.—The treatment of measles embraces the preventive measures to be adopted in the case of an outbreak by the isola-

tion of the sick at as early a period as possible. Epidemics have often, especially in limited localities, been curtailed by such a precaution. In families with little house accommodation this measure is frequently, for the reason already referred to regarding the communicable period of the disease, ineffectual; nevertheless, where practicable, it ought to be tried, for it is of doubtful wisdom to expose the healthy children in a family to the risk of infection under the idea that they must necessarily take the disease at some time or other. The unaffected children should likewise be kept from school for a time (probably about three weeks suffices from the outbreak in the family, if no other case occur in the interval), and all clothing which has been in contact with the patient should be subjected to disinfection or thorough washing.

As regards special treatment, in an ordinary case of measles little is required beyond what is necessary in febrile conditions generally. Confinement to bed in a somewhat darkened room, into which, however, air is freely admitted in such a way as to avoid drafts; light, nourishing diet (soups, milk, puddings, etc.), and mild diaphoretics, such as Mindererus spirit and ipecac, are all that is necessary in the febrile stage. When the catarrhal symptoms are very severe, the hot bath or warm packing to the body generally, or to the chest and throat, affords relief, and a hot bath, to which one or two tablespoonfuls of mustard are added, may, with advantage, be administered, if the eruption be feebly developed or tend to recede too soon, and especially if convulsions should set in. The serious chest complications of measles are to be dealt with by those measures applicable for the relief of pneumonia or bronchitis. The inhalation of vapor, and the administration of aromatic spirits of ammonia and other preparations of ammonia, are specially useful. Inflammation of the eyes is best soothed by washing several times daily with weak boric acid lotion, and thereafter smearing a little boric ointment on the edge of each lower lid. Ear complications, if they come on, usually appear with a discharge as the child is getting better. Diarrhea is treated by the usual remedies, including carefully administered doses of chalk mixture.

During convalescence, the patient must be guarded from exposure to cold, and, for a time after recovery, the state of the health ought to be watched with the view of averting the evils,

both local and constitutional, which but too often follow this disease.

If fever is high, give a saline purgative and follow in half an hour with the following:

℞ Tincture of Veratrum twenty drops
Powdered Gum Arabic twenty grains
Sweet Spirits of Niter one-half ounce
Water four ounces
Mix.
Dose: One teaspoonful every hour until temperature is lowered.

Or:

℞ Tincture of Aconite thirty-two drops
Water four ounces
Mix.
Dose: One teaspoonful every two hours for six doses.

Or:

℞ Tincture of Aconite twelve drops
Spirit of Mindererus one-half ounce
Solution Citrate of Potash .. one and one-half ounces
Simple Syrup one ounce
Mix.
Dose: One teaspoonful every two or three hours.

Or:

℞ Quinine Sulphate one dram
Tartaric Acid six grains
Mix, and make into thirty pills.
Dose: One pill; repeat if required.

If cough is present give slightly acid drinks, such as flaxseed tea made from one ounce of flaxseed to a pint of water to which a little lemon juice has been added.

WHOOPING-COUGH—PERTUSSIS

Definition.—Whooping-cough is an infectious disease of the mucous membrane lining the air-passages, which manifests itself by frequently recurring attacks of convulsive coughing followed by peculiar, loud indrawing of the breath, and often by vomiting. It occurs for the most part in children, and seldom more than once in a lifetime.

Causes.—The direct cause of whooping-cough is unknown, but the view which ascribes it to some atmospheric condition appears to derive support from the frequency of this disease as an epidemic; whether, however, the cause be a peculiar form of germ, as is held by some authorities, remains as yet undetermined. Although specially a disease of childhood, whooping-cough is by no means limited to that period, but may occur at any time of life, even to old age, should there have been no previous attack. It is most common between the ages of one and four, and is rare after ten. Statistics show that it is the most fatal of all diseases of children under one year, that sixty-eight per cent. of the deaths from whooping-cough occur under the age of two, and that only six per cent. of the deaths are recorded after five years. Whooping-cough is, therefore, a dangerous disease in infants, though but a trivial malady in older children. It has been occasionally observed in newly born infants, and is more common in female than in male children. Whooping-cough is highly infectious during any stage of its progress, but apparently more so in its beginning.

Symptoms.—With respect to the symptoms of whooping-cough, three stages of the disease are recognized, viz.: (1) the catarrhal stage, (2) the spasmodic stage, (3) the stage of decline.

The *first stage* is characterized by the usual symptoms of a catarrh, with sneezing, watering of the eyes, irritation of the throat, feverishness, and cough, but in general there is nothing in the symptoms to indicate that they are to develop into whooping-cough. The catarrhal stage usually lasts from ten to fourteen days.

The *second stage* is marked by the abatement of the catarrhal symptoms, but at the same time by increase in the cough, which now occurs in irregular paroxysms both by day and by night. Each paroxysm consists in a series of violent and rapid expiratory coughs, succeeded by a loud sonorous or crowing inspiration —the "whoop." During the coughing efforts the air is driven with great force out of the lungs, and, as none can enter the chest, the symptoms of impending asphyxia appear. The patient grows deep-red or livid in the face, the eyes appear as if they would burst from their sockets, and suffocation seems imminent till relief is brought by the "whoop"—the louder and more vigorous the better. Occasionally blood bursts from the nose,

mouth, or ears, or is extravasated into the conjunctiva of the eyes. A single fit rarely lasts beyond from half to three quarters of a minute, but after the "whoop" another recurs, and of these a number may come and go for several minutes. The paroxysm ends by the coughing or vomiting up of a viscid tenacious secretion, and usually after this the patient seems comparatively well, or, it may be, somewhat wearied and fretful. The frequency of the paroxysms varies according to the severity of the case, being in some instances only to the extent of one or two in the whole day, while in others there may be several in the course of a single hour. Slight causes serve to bring on the fits of coughing, such as the acts of swallowing, talking, laughing, crying, etc., or they may occur without any apparent exciting cause. In general, children come to recognize an impending attack by a feeling of tickling in the throat, and they cling with dread to their mother or nurse, or take hold of some object near them for support during the paroxysm; but, although exhausted by the severe fit of coughing, they soon resume their play, apparently little the worse.

The attacks are on the whole most severe at night. This stage of the disease usually continues during four to seven weeks, but it may be shorter or longer. It is during this time that complications are apt to arise which may become a source of danger greater even than the malady itself. The chief of these are inflammatory affections of the bronchial tubes and lungs, and convulsions, any of which may prove fatal.

When the disease progresses favorably, as it usually does, it passes into the *third* or *terminal stage,* in which the cough becomes less frequent and generally loses in great measure its whooping character. The patient's condition altogether undergoes amendment, and the symptoms disappear in from one to three weeks. It is to be observed, however, that for a long period afterward in any simple catarrh from which the patient suffers the cough often assumes a spasmodic character, which may suggest the erroneous notion that a relapse of the whooping-cough has occurred.

Treatment.—As regards the treatment of whooping-cough in mild cases, little is necessary beyond keeping the patient warm and carefully attending to the general health. The remedies applicable in the case of catarrh or the milder forms of bronchitis

are of service here, while gentle counter-irritation to the chest by stimulating liniments may be employed all through the attack. In mild weather the patient may be in the open air. In the more severe forms, efforts have to be employed to modify the severity of the paroxysms. Numerous remedies are recommended, the chief of which are the bromides of ammonium or potassium, belladonna, etc. These can only be safely administered with due regard to the symptoms in individual cases. During convalescence, where the cough still continues to be troublesome, a change of air will often effect its removal.

The following remedies have been found valuable in relieving the severity of the attacks:

Quinine Sulphate.—Give as many grains during twenty-four hours as is the age of the child in years; for instance, to a child ten years of age give ten grains during twenty-four hours, divided into five doses of two grains each.

Lemon and Honey.—A half-pint of strained honey and the juice of one large lemon mixed thoroughly. Give a tablespoonful every hour.

The following also will be found very beneficial:

℞ Molasses two ounces
Whisky two ounces
Essence of Peppermint one teaspoonful
Mix.
Dose: Ten drops up to two years; thirty drops up to three years; one teaspoonful over three years.

℞ Thymol twenty grains
Oil of Eucalyptol two drams
Oil of Sassafras two drams
Oil of Peppermint two drams
Spirits of Turpentine two drams
Liquid Tar two drams
Ether four drams
Alcohol two and one-half ounces
Mix.
Directions: Saturate a pad with half a teaspoonful of this mixture and hang it, by means of a string or tape, around the child's neck. Renew several times a day.

Or:

℞ Fluidextract of Chestnut three drams
Tincture of Belladonna two drams
Syrup of Wild Cherry, to make..... two ounces

Mix.

Dose: One teaspoonful, three or four times a day.

Or:

℞ Antipyrine fifteen grains
Bromide of Potash thirty grains
Syrup of Senega two drams
Syrup of Tolu, to make two ounces

Mix.

Dose: One teaspoonful, three or four times a day.

Vapo-cresolene Lamp.—The burning of one of these lamps is said to be very beneficial; they can be bought in any drug store, and full directions for use come with each lamp.

During an attack of coughing, place the patient face down, with the head lower than the body, and remove the mucus from the mouth with the finger.

Pressing of the hand over the eyes gives relief by preventing the strain upon them.

DIPHTHERIA

Definition.—This is, in the great majority of instances, an infectious form of sore throat, characterized by the presence of patches of membrane on the throat. Although popularly believed to be a newly discovered disease, there is distinct evidence that diphtheria was known to the ancient physicians as a malady of great virulence.

Causes.—There is no doubt that the disease is generally conveyed by direct contagion, as by kissing an affected person, using his cup or spoon, or receiving a drop of saliva or fragment of membrane upon the lips or face through incautiously approaching him when he is coughing. The contagious nature of the disease is also exemplified in the case of medical men who have fallen victims to inoculation with its morbid products while

examining the throats of, or performing tracheotomy upon, those suffering from diphtheria.

The bacillus grows freely in milk, and it is likely that the use of this article of food during a diphtheria epidemic is often responsible for the spread of the disease. Cats are very liable to diphtheria, and it has been proved that children have contracted the malady through fondling a sick animal. The emanations from foul drains seem to have a special tendency to bring on diphtheria, either because the bacillus flourishes in such localities, or possibly because these emanations produce various kinds of sore throat, and predispose persons to diphtheritic infection.

Symptoms.—In general, following an incubation period of about two days after infection, symptoms set in like those commonly accompanying a cold, viz., chilliness and depression. Sometimes very severe disturbances usher in an attack, such as vomiting and diarrhea. A slight feeling of uneasiness in the throat is experienced along with some stiffness of the back of the neck. When looked at, the throat appears reddened and somewhat swollen, particularly in the neighborhood of the tonsils, the soft palate, and upper part of the pharynx, while along with this there is tenderness and swelling of the glands at the angles of the jaws. The affection of the throat spreads rapidly, and soon the characteristic exudation appears on the inflamed surface in the form of grayish-white specks or patches, increasing in extent and thickness until a yellowish-looking false membrane is formed. This deposit is firmly adherent to the mucous membrane beneath, or is incorporated with it, and if forcibly removed it leaves a raw, bleeding, ulcerated surface, upon which it is reproduced in a short period. The appearance of the exudation has been compared to wet parchment or washed leather, and it is more or less dense in texture. It may cover the whole of the back of the throat, the cavity of the mouth, and may spread downward into the air-passages on the one hand and into the alimentary canal on the other, while any wound on the surface of the body is liable to become covered with it. But it is usually limited to part of the area named.

Treatment.—Regard must be had both to the local and to the general nature of the disease. Difference of opinion formerly existed as to the advisability of applying strong antiseptic lotions and gargles to the affected parts, some attaching great



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DIPHTHERITIC SORE THROAT

importance to their use as tending to arrest the progress of the disease, while others held that the irritation so produced favored the spread of the false membrane. Certainly, after any considerable surface has been invaded by the false membrane, little good, it is to be feared, can be done in this way. The forcible removal of the false membrane is generally condemned, as by this means a raw bleeding surface is left, upon which the deposit is reproduced with great rapidity. The exudation, however, tends to be cast off spontaneously by a process of suppuration, and as favoring this, and at the same time acting as a soothing remedy, the inhalation of steam is recommended. Another method, often adopted in order to assist the separation and prevent the spread of the false membrane, consists in the careful application of toluol to the patches, every four hours, with a brush. The employment, in the form of spray or of washes or gargles, of solutions of peroxide of hydrogen, permanganate of potassium, perchloride of iron, chlorine water, listerine, or chlorate of potash, sufficiently weak in watery solution to avoid irritating effect, is valuable in the way of disinfecting the parts and subduing the fetid exhalations which are always present. Of these perhaps the favorite at the present time is peroxide of hydrogen diluted with water. When the disease has spread into the larynx and the breathing is embarrassed, an emetic may be of use in aiding the expulsion of the false membrane.

Since about 1894, an antitoxic serum, prepared from the blood serum of horses which have been rendered by inoculation immune against diphtheria, has come into use and has greatly improved the results of treatment in this disease. It is injected by means of a syringe and hollow needle into the subcutaneous tissue either of the back or of a limb. Prior to this date, the mortality in public hospitals of all cases of diphtheria was about thirty per cent.; while, since antitoxic treatment became general, it is said to have been reduced to about half that figure. Further, cases which receive this treatment early in the disease appear to run a much milder course than those not so treated. The use of antitoxic serum is quite free from ill effect, a temporary rash and slight feverishness being the worst symptoms which have been attributable to its use. Injection of antitoxic serum is often used as a precautionary measure for other members of a household in which one has contracted diphtheria.

The following prescriptions are of value:

℞ Chlorate of Potash one dram
Tincture of Iron one dram
Muriate of Ammonia one dram
Glycerine one ounce
Water one ounce
Mix.
Dose: One teaspoonful every two hours.

To a child five or six years old, give the following:

℞ Tincture of Guaiac one-half ounce
Chlorate of Potassa one and one-half drams
Peppermint-water three ounces
Mix.
Dose: One teaspoonful every three hours.

Or:

℞ Tincture of Chloride of Iron one-half ounce
Dose: Twenty drops every three hours.

Kerosene Remedy.—Put four or five drops of kerosene on a lump of sugar and let the child suck on it. At the same time saturate a piece of flannel with kerosene-oil and apply it over the part as indicated by the shaded area in the accompanying illustration, tying over the head.



Lemon Remedy.—Persuade the child to suck gradually the juice of half a lemon.

Diet.—This should consist chiefly of milk and occasional broths.

HOOKWORM—ANCHYLOSTOMA—UNCINARIA

Definition.—The hookworm, or *Anchylostoma duodenale,* derives its name from the fact that it chiefly inhabits the duodenum, or first part of the small intestine. It is very common in most of the Southern States, owing to the lack of proper sanitary conditions.

Causes.—The infection is due to the eggs being swallowed in drinking-water or contaminated foods; they may also gain entrance into the body by burrowing through the skin; or they may

be carried by flies. The worms are from about one third of an inch to one inch in length, and the mouth is provided with sharp hooks, which enables them to secure their hold.

Symptoms.—The chief symptom produced is a profound anemia, with its concomitant symptoms, such as languor, breathlessness, increasing debility, and swelling of the feet and ankles. There is usually also dyspepsia, pain in the upper part of the abdomen, diarrhea, and malena, or black, tarry-looking stools, from the presence of altered blood in them. The blood often presents rather characteristic appearances on microscopic examination, but a positive diagnosis of the disease is most readily made by microscopic examination of the stools, the typical eggs of the worms being found there in abundance.

Treatment.—The destruction of the worms in the body is best carried out by means of thymol. This drug requires to be given in doses sufficient to cause some collapse on the part of the patient, so that it should only be taken under medical supervision. From twenty to thirty grains in a capsule are given on an empty stomach; this is repeated in a couple of hours, and followed by a strong saline purge, such as Epsom salts. The thymol may require to be given again a few days later. The anemia requires treatment by iron, as follows:

℞ Syrup of Iron Iodide one ounce
Dose: Fifteen drops in water, directly after meals.

Or:

℞ Elixir of Iron, Quinine, and Strychnine .two ounces
Dose: One teaspoonful in water three times a day, half an hour before meals.

Or:

℞ Blaud's Iron Pills three grains
Dose: For a child five years and over, one pill three times a day after meals.

Prevention.—Prevention requires the exclusion of infected persons from earth workings, and defecation in mines or tunnels should be rigorously prohibited. Care should also be taken to wash the hands free from soil before eating, to see that the water is boiled or filtered before drinking, and that the shoes are in good condition, as one must not overlook the fact that infection is quite possible to take place through abrasions in the skin.

SCARLET FEVER OR SCARLATINA

Definition.—Scarlet fever and scarlatina are names applied indifferently to an acute infectious disease, characterized by high fever, accompanied with sore throat and a diffuse red rash upon the skin. This fever appears to have been first accurately described by Sydenham in 1676, before which period it had evidently been confounded with smallpox and measles.

Causes.—It is a highly contagious malady, the infective material being one of the most subtle, diffuse, and lasting known in fevers. It would seem that the disease is communicable from an early period of its occurrence, all through its progress, and especially during convalescence, when the process of desquamation is proceeding, and when the shed-off scales of the skin which contain the poison of the disease in great abundance are apt to be inhaled, to become attached to articles of clothing, to find entrance into food, or to be transmitted in other ways to healthy persons. It is a disease for the most part of early life, young children being specially susceptible; but adults may also suffer if they have not had this fever in childhood.

Symptoms.—The period of incubation in scarlet fever (that is, the time elapsing between the reception of the poison and the development of symptoms) appears to vary. Sometimes it would seem to be as short as one or two days, but in many instances it lasts about a week. The invasion of this fever is generally sudden and sharp, consisting in rigors, vomiting, and sore throat, together with a rapid rise of temperature and increase in the pulse. Occasionally, especially in young children, the attack is ushered in by convulsions. These premonitory symptoms usually continue for about twenty-four hours, when the characteristic eruption makes its appearance. It is first seen on the neck, chest, arms, and hands, but quickly spreads all over the body, although it is not distinctly marked on the face. This rash consists of minute, thickly set red spots, which coalesce to form a general diffuse redness, in appearance not unlike that produced by the application of mustard to the skin. In some instances the redness is accompanied with small vesicles containing fluid. In ordinary cases the rash comes out completely in about two days, when it begins to fade, and by the end of a

week from its first appearance it is usually gone. The severity of a case is in some degree measured by the copiousness and brilliancy of the rash, except in the malignant varieties, where there may be little or no eruption. The tongue, which at first was furred, becomes about the fourth or fifth day denuded of its epithelium, and acquires the peculiar "strawberry" appearance characteristic of this fever. The interior of the throat is red and somewhat swollen, especially the uvula, soft palate, and tonsils, and a considerable amount of secretion exudes from the inflamed surface.

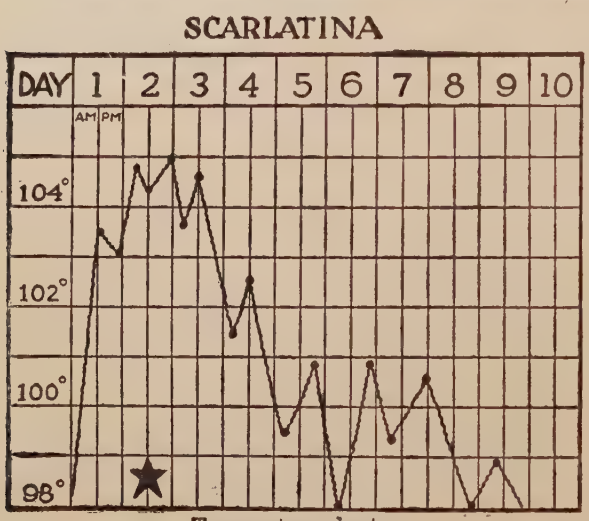
Varieties.—Scarlet fever shows itself in certain well marked varieties, of which the following are the chief:

1. *Scarlatina simplex* is the most common form; in this the symptoms, both local and general, are moderate, and the case usually runs a favorable course. It is always, however, to be borne in mind that the duration and the infectiveness of the disease, including its convalescence, are uninfluenced by the mildness of the attack. In some rare instances it would seem that the evidences of the disease are so slight, as regards both fever and rash, that the disease escapes observation and only becomes known by the patient subsequently "peeling" or suffering from some of the complications associated with it. In such cases the name *latent scarlet fever* (*scarlatina latens*) is applied.

2. *Scarlatina anginosa* is a more severe form of the fever, particularly as regards the throat symptoms. The rash may be well marked or not, but it is often slow in developing and in subsiding. There is intense inflammation of the throat; the tonsils, uvula, and soft palate being swollen and ulcerated, or having upon them membranous patches not unlike those of diphtheria, while externally the gland tissues in the neck are enlarged and indurated and not infrequently become the seat of abscesses. There is difficulty in opening the mouth; an acrid discharge exudes from the nostrils and excoriates the lips, and the countenance is pale and waxy-looking. This form of the disease is marked by great prostration of strength, is often attended by delirium, and is much more frequently fatal than the preceding.

3. *Scarlatina maligna* is the most serious form of all. The malignancy may be variously displayed. Thus a case of scarlatina anginosa may acquire such a severe character, both as to

throat and general symptoms, as rapidly to produce profound exhaustion and death. But the typically malignant forms are those in which the attack sets in with great violence and the patient sinks from the very first. In such instances the rash either does not come out at all or is of the slightest amount and of livid rather than scarlet appearance, while the throat symptoms are often not prominent. Death in such cases may take place in from twenty-four to forty-eight hours, and is frequently preceded by great elevation of the temperature of the body and by delirium, coma, or other nervous symptoms. A further example of a malignant form is occasionally observed in cases where the rash, which had previously been well developed, suddenly recedes, and convulsions or other nervous phenomena and rapid death supervene.



Temperature chart.

Treatment.—In the treatment of scarlet fever, one of the first requirements is the isolation of the case, with the view of preventing the spread of the disease. In large houses this may be possible, but in most instances it can only be satisfactorily accomplished by sending away those other members of the family who have not suffered from the fever. The establishment in many large towns of hospitals for infectious diseases, which provide accommodation for patients of all classes, affords the best of all opportunities for thorough isolation. In large families, where few or none of the members have had the disease, the prompt removal of a case to such a hospital will in many instances prevent the spread of the fever through the household, as well as beyond it, and at the same time obviate many difficulties connected with the cleansing and purification of the house, which, however carefully done, may still leave re-



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SCARLATINA

maining some risk in the case of a fever the contagious power of which is so intense.

All books, toys, etc., used by the patient during the illness should be carefully destroyed, as their preservation has frequently been known to cause an outbreak of the disease at a subsequent time. With respect to the duration of the infective period, it may be stated generally that it is seldom that a patient who has suffered from scarlet fever can safely go about before the end of eight weeks, while, on the other hand, the period may be considerably prolonged beyond this, the measure of the time being the completion of the process of peeling of the skin in every portion of the surface of the body, and the complete absence of all discharges. As to general management during the progress of the fever, in favorable cases little is required beyond careful nursing and feeding. The diet all through the fever and convalescence should be of light character, consisting mainly of milk food. Soups may be taken, but solid animal food should as far as possible be avoided. During the febrile stage a useful drink may be made by a weak solution of chlorate of potash in water (one dram to the pint), and of this the patient may partake freely. In the more severe forms of the disease, where the throat is much affected, the application with a brush of a strong solution of permanganate of potassium or other disinfectant, such as Dobell's solution, may be required, or gargling with these substances when this can be done. When there is discharge from the ears, they may be syringed with warm boric lotion, which both gives great relief and purifies the discharge. In the malignant variety, where the eruption is not appearing or is but ill developed, stimulants internally, and the hot bath or pack, may sometimes afford a chance, or the hypodermic use of pilocarpin—although it must be confessed that in such cases little can be expected from any remedies. The treatment of the kidney complication and its accompanying dropsy is similar to that for acute Bright's disease. One high authority gives it as his opinion that this kidney complication can usually be prevented by careful regulation of the bowels during convalescence. When it has occurred, depletion by dry-cupping over the loins, and the promotion of cutaneous action by a hot-air bath or a hot wet-pack, or by pilocarpin, are the most useful measures, and will often succeed in saving life. The abscesses of

the neck which occasionally occur as complications should be opened antiseptically, while the ear disorders, which are apt to continue long after the termination of convalescence, will demand the attention of an ear specialist.

℞ Chlorate of Potash two drams
Tincture of Lobelia two drams
Tincture of Iron two drams
Simple Elixir, to make four ounces
Mix.
Dose: One teaspoonful every four hours.

The following mixture used as a gargle every hour or two has been found valuable: White-oak bark (tannin), one ounce, steeped in one pint of water for twenty minutes; let cool, and add one teaspoonful of sugar and one teaspoonful of powdered alum.

LIBERTY MEASLES—GERMAN MEASLES—RUBELLA—ROETHELN

Definition.—This is an acute infectious disease of a very mild type which resembles both measles and scarlatina, and which is known also by the following names—rubella, roetheln, epidemic roseola, hybrid measles, and hybrid scarlet fever.

Cause.—It is highly infectious, though the cause of infection, whether of bacterial nature or otherwise, has not been discovered. Previous attacks of measles and scarlatina give no protection against it, and it frequently attacks adults. As the stage of incubation after infection and before the disease shows itself is long, a child from an infected household cannot be considered free from the risk of catching this disease till he has been isolated for about twenty days.

Symptoms.—The symptoms are very mild, and the disease is not at all serious. On the day of onset there may be shivering, headache, running of the nose and eyes, very slight fever, not above 100° F., and at the same time the glands of the neck become enlarged. These symptoms may all be so slight, however, as to escape notice. On the second day a pink, slightly raised eruption appears, first on the face, then on the chest, and on the third day spreads all over the body. The rash lasts the greater

part of a week, longer than that of measles or scarlatina, and as it disappears fine bran-like scales separate from the surface.

Treatment.—The only treatment necessary is confinement to bed at first, and isolation from other children, keeping the bowels open and giving warm drinks. The child may be considered free of infection when the scales have ceased to separate, or in about ten days after the eruption has appeared.

No special diet is needed, but should the rash appear during the summer season, give a light diet with acid drinks. If, on the other hand, the disease appears during the fall, give the following:

℞ Diluted Sulphuric Acid sixteen drops
Epsom Salts four drams
Compound Infusion of Gentian six ounces
Mix.
Dose: One teaspoonful every six hours.

CHICKEN-POX—VARICELLA

Definition.—Chicken-pox is an acute contagious disease of children, characterized by feverishness and an eruption on the skin, consisting in the appearance of successive crops of vesicles, or little raised blisters, about the size of a pea. The disease is quite distinct from smallpox; the one affords no protection against the other, nor does vaccination protect against chicken-pox.

Causes.—It is caused by a germ, and generally occurs in epidemics; it is very contagious, the infection spreading by close personal contact or by clothes.

Symptoms.—There is an incubation period of from ten to fifteen days between the exposure to infection and the first appearance of symptoms. For about one day the child is feverish and out of sorts, then the rash appears. The rash begins as small, red, raised pimples on the forehead, face, and trunk, which in a few hours become vesicles filled with clear fluid. In one or two days the fluid becomes turbid, and soon dries up into a scab, which later drops off, leaving no scar. Several crops of vesicles appear for three or four successive days after the first crop, each lot running through the same stages as the original. Alto-

gether there may be a few hundred pocks spread more or less over the whole body, or there may only be a dozen or so. There is slight feverishness until the vesicles have all dried up into scabs. Recovery is usually quite perfect; only very rarely do severe cases occur, which may be like mild smallpox, and difficult to distinguish from that disease. Adults also are affected occasionally.

Treatment.—The child must be isolated until all the scabs have separated—two to three weeks, probably—but need only be kept in bed until all the vesicles have dried up into scabs. The only treatment necessary is to relieve the itching, which is apt to lead to scratching, and this may injure the true skin and cause permanent disfigurement. This is best done by bathing the skin with a lotion of one part of carbolic acid to sixty parts of water, and by muffling up the patient's hands. If there be much eruption on the scalp, the hair would better be cut short.

The bowels must be kept open; if no free movement, give a dose of castor-oil in fruit juice.

If fever is present, give the child sweet spirits of niter; dose, at ten years of age, twenty to thirty drops in water; or the following mixture:

℞ Tincture of Aconite thirty drops
Sweet Spirits of Niter two drams
Spirit of Mindererus one ounce
Simple Syrup one ounce
Mix.
Dose: One teaspoonful every three hours.

CROUP

Definition.—Croup is a disease of childhood, commonest during its second and third years, in which swelling and partial blockage of the entrance to the larynx occur, often with considerable suddenness, causing difficulty of breathing and partial suffocation.

Spasmodic croup, or laryngismus, is another condition to which children are liable, very similar in symptoms, but of a purely nervous nature.

Causes.—Croup has been much confused with diphtheria, which is a vastly more serious complaint. The reason of this is



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CHICKEN-POX

that, originally, one of the constantly described symptoms of croup was the formation of a "false membrane," resembling chamois leather, on the throat. Later it was shown that this occurs most frequently in serious cases of throat inflammation due to a particular bacillus (the Klebs-Loeffler bacillus), and these cases have been separated off as the special disease called diphtheria. Croup includes the other cases due to slighter forms of inflammation, such as the effects of a chill, breathing of irritating vapors, swallowing of very hot water, etc., and there may be, or frequently is not, a false membrane. In any case, the throat, and particularly the entrance to the larynx, which in young children will barely admit the tip of the little finger, becomes inflamed and swollen till the opening is almost closed. The passage is still further narrowed by mucus excreted from the inflamed surfaces, and by spasm in the muscles of the larynx.

Symptoms.—The attack usually comes on at night, when the child is in bed, and follows a chill caught during the day, or an ordinary cold that has lasted perhaps for some days. The breathing is hoarse and croaking (hence the name of the disease), the voice thin, the cough paroxysmal and metallic in tone, and the air passes in with a harsh, loud noise. The child is frightened and excited at first, but later gets feeble and livid. Still later, pallor, sweating, and great struggling for breath come on, and may last half an hour or several hours. After this the symptoms begin to abate, gradually pass away, and the child falls asleep, but there is always a danger that the larynx may become completely blocked, in which case death ensues in a few minutes. A fatal termination is rare if the child receive proper treatment, and the alarming symptoms usually abate on the day following the attack, to return, it may be, on the succeeding night. A child who has once had croup is liable to have future attacks, and so should be specially guarded against cold and damp till he has outgrown the tendency.

Treatment.—The child should be put into a hot bath to which a tablespoonful of mustard has been added, in order to relieve the congestion of internal organs, and a tent should be made with a blanket over the bath, so that he may inhale the steam. When he is put back into bed the tent should be put over the bed, and the nozzle of a steam-kettle brought within it. To the water in the kettle may be added a teaspoonful of compound tincture of

benzoin, of vapor of creosote, or of other soothing substance. At the commencement, an attack is often checked by the administration of a teaspoonful of ipecacuanha wine every ten minutes till vomiting takes place.

After an attack, the general health should receive attention, and where attacks are of spasmodic nature a course of bromides may be advisable.

The following remedies have all been found beneficial.

Local applications should be made to the throat as indicated by the shaded area in the accompanying illustration.



Hot Water.—A napkin wrung out in hot water and put around the neck of the child will often give relief in a few minutes.

Fat Bacon or Pork.—A couple of strips of fat bacon or pork tied around the throat will often give relief at once, especially if a few drops of coal oil (kerosene) dropped on a little sugar are taken internally at the same time.

Alum.—Mix the whites of two eggs with a teaspoonful of powdered alum and three teaspoonfuls of honey or molasses. Dose for a child one year of age, one teaspoonful every fifteen minutes until relieved.

Kerosene (Coal Oil).—Soak a piece of woolen cloth or flannel in hot water; wring out the water and sprinkle fifteen drops of kerosene on the flannel, and apply to the throat. Or, give internally four to six drops of kerosene on sugar.

Turpentine.—Turpentine may be used instead of kerosene oil.

Linseed Oil.—Half a teaspoonful of raw linseed oil given internally will usually cause vomiting; in severe cases a full teaspoonful may have to be given.

Compound Tincture of Benzoin.—One or two teaspoonfuls of the compound tincture of benzoin in a pint of boiling water and the fumes inhaled through a cornucopia will often give relief at once.

Onions and Bacon.—Chop the onions and place on a strip of fat bacon or pork and apply around the throat.

Syrup of Ipecac.—Give ten to fifteen drops of syrup of ipecac every fifteen minutes until vomiting occurs; or, dissolve twenty drops of powdered ipecac in one teaspoonful of water, add to this one teaspoonful of sugar, add this to a teacupful of boiling

water and let boil down to one-half cup. Dose for a child six years of age, fifteen drops every hour; or if vomiting is desired, repeat in fifteen minutes.

Vaseline.—Rub on throat and chest and cover with hot, dry flannel; also give one quarter of a teaspoonful of vaseline internally.

Salt.—Place hot, parched salt in a stocking and apply to throat; it will produce redness and give relief in a few minutes.

The following may be found useful:

℞ Glycerine thirty drops
Sugar two drams
Brandy one ounce
Water one ounce
Mix.

Dose: One teaspoonful every hour, or oftener if necessary.

In connection with this apply a napkin wrung out in cold water around the throat and cover with flannel.

Or:

℞ Oil of Turpentine one dram
Oil of Sweet Almond two and a half drams
Simple Syrup three drams
Mucilage Acacia ten drams
Peppermint-water three ounces
Yolk of one Egg
Mix.

Dose: One teaspoonful every hour.

Or:

℞ Syrup of Squill three drams
Syrup of Ipecac three drams
Simple Syrup, to make four ounces

Dose: One teaspoonful every half-hour until relieved.

Or:

℞ Fluidextract of Licorice one dram
Syrup of Squill two drams
Syrup of Ipecac two drams
Syrup of Senega one dram
Syrup of Tolu, to make two ounces
Mix.

Dose: One-half teaspoonful every hour.

Or:

℞ Boric Acid twenty grains
Borax two drams
Syrup of Gum Arabic three drams
Water, to make two ounces
Mix.
Dose: One-half teaspoonful every hour.

MUMPS—PAROTITIS—SPECIFIC PAROTITIS

Definition.—This is an infectious disease characterized by inflammatory swelling of the parotid and other salivary glands, frequently occurring as an epidemic, and affecting mostly young persons.

Causes.—Mumps is highly infectious from person to person, though it seldom affects adults or those who have had the disease already. It appears to be infectious even for a week or two after the swelling of the glands has subsided.

Symptoms.—There is a long incubation period of two to three weeks, after infection, before the glands begin to swell. The first signs are fatigue, slight feverishness, and sore throat, which may precede the swelling by a day or two. The gland first affected is generally the parotid, situated in front of and below the ear, and along with the swelling there is often some faceache and considerable rise of temperature (to 101° or even 104° F.). The swelling usually spreads to the submaxillary and sublingual glands lying beneath the jaw, and to the glands on the side opposite that first affected. There is hardly ever any redness or tendency to suppuration in the swollen parts, though interference with the acts of chewing and swallowing may occasion a good deal of trouble. After continuing four or five days the swelling abates, the temperature having generally already fallen.

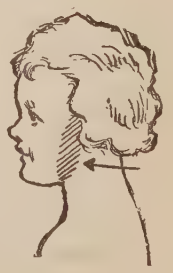
Treatment.—During the two or three days that the fever lasts, the patient should remain in bed, and he should be confined to one room, or at all events should avoid other children for about three weeks, in order to prevent the spread of infection. Soft food, mild aperients, and the protection of the inflamed parts by a strip of flannel or by cotton-wool and a handkerchief, are all the treatment usually required. If an abscess should form, it is treated like an abscess elsewhere. If there be much faceache,

it is relieved by warm camphorated oil, or an ointment composed of one part of ichthyol and four parts of lanolin. After the attack subsides, tonics are called for.

It is important that, if a child has been exposed to the infection of mumps, he should be kept from school, and from mixing with healthy children, till three or four weeks have elapsed.

The bowels must be kept open with saline aperients.

Flaxseed.—A poultice of flaxseed applied over the swollen gland, as indicated by the shaded area in the accompanying illustration, will usually give relief from pain.



Bean Poultice.—When the swelling starts to go down, a bean poultice applied hot and frequently changed is very good. Boil the beans until they are very soft, then make a poultice by laying the hot bean paste between layers of gauze or thin cloth; apply while hot.

Mullein Poultice.—A mullein-leaf poultice made by laying several leaves between thin cloth wrung out in hot water, and over which a little camphorated oil has been sprinkled, is very beneficial.

Sage Tea.—Sage-leaf tea, made by using half an ounce of the leaves to a pint of boiling water and steeped for fifteen minutes, is a very good remedy if drunk freely.

Leeches.—If the glands are very painful, leeches may be applied to get relief.

Steam Bath.—A daily steam bath and compresses of water at from 68° to 73° F., around the neck at the same time, are of value. The compresses should be changed whenever they become uncomfortably hot. After the steam bath, which should last about an hour, the patient is sponged with water at about 73° F.

The following mixture will also be found valuable:

℞ Sulphate of Quinine twenty grains
Salt one dram
Spirit of Mindererus four drams
Sweet Spirits of Niter four drams
Simple Elixir, to make four ounces

Mix.

Dose: For a child ten years of age, one teaspoonful every three hours; adult dose, two teaspoonfuls.

ST. VITUS'S DANCE—CHOREA

Definition.—This is the name now applied to a disorder of the nervous system occurring for the most part in children, and characterized mainly by involuntary jerking movements of the muscles.

Causes.—It is to be regarded as a functional nervous disorder of wide extent, the manifestations of which appear chiefly in disturbances affecting the muscles. Among the predisposing causes age is important, chorea being essentially an ailment of childhood, and more particularly of the period in which the permanent teeth are appearing. The greater number of the cases occur between the ages of nine and twelve. It is not often seen in very young children, nor after puberty; but there are many exceptions to this rule. It is twice as frequent with girls as with boys. Hereditary predisposition to nervous troubles is apt to find expression in this malady in youth, more especially if the general health becomes lowered. Of exciting causes, strong emotions, such as fright, ill-usage or hardship of any kind, insufficient feeding, overwork or anxiety, are among the most common; while, again, some distant source of irritation, such as teething or intestinal worms, appears capable of giving rise to an attack.

Symptoms.—The symptoms of St. Vitus's dance are in some instances developed suddenly as the result of fright, but much more frequently they come on insidiously. They are usually preceded by changes in the temper and disposition, the child becoming sad, irritable, and emotional, while at the same time the general health is somewhat impaired. The first thing indicative of the disease is a certain awkwardness or fidgetiness of manner, together with restlessness, the child being evidently unable to continue quiet, but frequently moving the limbs into different positions. In walking, too, slight dragging of one limb may be noticed. The convulsive muscular movements usually show themselves first in one part, such as an arm or a leg, and in most instances they may remain localized to that limited extent, while in all cases there is a tendency for the disorderly symptoms to be more marked on one side than on the other. Speech is affected, both from the incoördinate movements of the tongue and from speech sometimes taking place during the act of drawing a

breath. The taking of food becomes a matter of difficulty, since much of it is lost in the attempts to convey it to the mouth, while swallowing is also interfered with owing to the irregular action of the throat muscles.

Treatment.—For the treatment of St. Vitus's dance the remedies proposed have been innumerable, but it is doubtful whether any of them have much control over the disease, which under suitable hygienic conditions tends to recover of itself. These conditions, however, are all-important, and embrace the proper feeding of the child with nutritious light diet, the absence of all sources of excitement and annoyance, such as being laughed at or mocked by other children, and the removal of any causes of irritation and of irregularities in the general health. For a time, and especially if the symptoms are severe, confinement to the house or even to bed may be necessary, but as soon as possible the child should be taken out into the open air and gently exercised by walking. Of medicinal remedies the most serviceable appear to be arsenic and iron, which act as tonics to the system and improve the condition of the blood. They should be continued during the whole course of the disease and convalescence, if they do not disagree.

The following has been found of value:

℞ Fowler's Solution one ounce
Dose: One drop in water, three times a day. Increase each dose one drop each day until puffiness of the eyes and looseness of the bowels occur; then start over again with one drop for a dose.

When St. Vitus's dance is associated with rheumatism, use the following:

℞ Fluidextract of Cimicifuga one ounce
Dose: Ten to fifteen drops in water three times a day.

CHILLS AND FEVER

Chills are usually the advance agent of some disease, and the child, if taken with a chill, should be carefully watched for symptoms that may develop. Abortive treatment used at once will often forestall the development of more serious disease. Always open the bowels by giving a saline purgative or castor-oil.

Mustard Foot-bath.—Wrap the child in a blanket and give a mustard foot-bath (one tablespoonful of ground mustard to a gallon of water). When the feet and legs become red, dry the child, wrap in a warm blanket, and put him in bed. A glass of hot milk, or hot lemonade to older children, given at the same time, is also beneficial.

Chloroform and Turpentine.—A very old remedy is to apply a liniment made of equal parts of chloroform and Venice turpentine. This is rubbed on the back of the neck, down the spine, and also on the small of the back. It is said to be an excellent remedy if the chills alternate with fever. Also give a hot drink.

Horseradish.—Another old remedy for chills and fever, one for which very good results are claimed, is to apply a poultice of fresh horseradish leaves to the soles of the feet. Pound the leaves to a pulp-like consistency, place on gauze or linen, and apply to the soles of the feet; bandage to hold them in place. It will reduce the fever and have a beneficial effect in general.

For the reduction of fever, the following are valuable:

Orange Juice.—The juice of oranges taken freely will reduce the fever.

Sweet Spirits of Niter.—This is probably the best remedy that can be used for either reducing fever or inducing free perspiration. If given for chills, it must be taken in conjunction with hot lemonade, and the child should be put in bed, well covered with blankets. If the opposite effect is desired and the niter is given for the purpose of reducing fever, it must be given in *cold* water, and the child should be kept lightly covered and cool. Dose for a child one year of age, three to six drops; two years, eight drops; three years, ten drops; six years, fifteen drops; twelve years, thirty drops. This drug, to be effective, must be fresh, as it loses its value. When fresh, it is always sweet to the taste; if it effervesces when bicarbonate of soda is added to it, it should be discarded, as the ethyl nitrite has escaped, leaving the drug valueless.

Dogwood.—An infusion of dogwood, made by adding a quart of water to one ounce of dogwood root and boiling down to a pint, cooled and strained, and given in the following doses, is valuable for chills and fever. Dose for a child one year of age, one teaspoonful; four years, two teaspoonfuls; nine years, three teaspoonfuls; twelve years, one tablespoonful.

Or:

℞ Pulverized Peruvian Bark . one and one-half drams
Pulverized Rhubarb one and one-half ounces
Pure Whisky six ounces

Mix.

Dose: For a child two years of age, one-half teaspoonful; four years, three-quarters of a teaspoonful; nine years, one and one-half teaspoonfuls; twelve years, one-half tablespoonful.

SPLENIC ANEMIA

Definition.—Splenic anemia is an affection to which infants are especially liable. Its characteristic features are progressive anemia, enlargement of the spleen, certain changes in the blood, and wasting.

Causes.—This condition may occur in syphilitic or rachitic infants, while it does not seem to be at all connected with either of these maladies, if judged by the results of treatment. It is maintained by many to be due to some chronic affection of the bowels.

Treatment.—There is no direct curative treatment, but if the health of the infant can possibly be kept up through the prolonged course of the illness, and if intercurrent disease be warded off, the course of the affection will be a favorable one, for many cases recover ultimately. The dietetic and hygienic surroundings must be very carefully regulated; very often a complete change of diet will be of considerable service, as, for example, from milk and puddings to meat and vegetable and chicken soup. It cannot be too strongly urged that special attention be given to the matter of maintaining the alimentary tract in a healthy condition. It must also be borne in mind how essential fresh air is to the well-being of the infant; therefore he should have as much of that element, as well as of sunshine, as possible. Iron should be given in small doses in the form of the alkaline iron mixture, as represented in the second of the following mixtures, or in the form of aperient iron mixture, as represented in the last. It is advisable to avoid the use of all patent preparations containing iron. In the case of rheumatic children, the pains are likely to be brought on by the use of iron. As a result of vast

experience, it is the recommendation of an eminent specialist that, in the treatment of anemia, an acid iron mixture, an alkaline iron mixture, and an aperient iron mixture should be employed, as they will invariably be found to be quite sufficient to meet the requirements of the case.

The mixtures are as follows, and the dose is for a child five years old; for larger children, give proportionately larger doses.

Acid Iron Mixture

℞ Liquor of Chloride of Iron two drams
Diluted Hydrochloric Acid ...one and one-half drams
Glycerine one ounce
Infusion of Calumba, to make .six ounces
Mix.
Dose: One teaspoonful three times a day.

Alkaline Iron Mixture

℞ Iron and Ammonia Citrate two drams
Bicarbonate of Soda four drams
Glycerine one ounce
Water, to make six ounces
Mix.
Dose: One teaspoonful three times a day.

Aperient Iron Mixture

℞ Sulphate of Iron twenty-four grains
Sulphate of Magnesia one ounce
Dilute Sulphuric Acid twenty-four drops
Glycerine one ounce
Water, to make six ounces
Mix.
Dose: One teaspoonful three times a day.

INCONTINENCE OF URINE—ENURESIS—BED-WETTING

Definition.—Incontinence of urine, otherwise known as **enuresis**, is the inability to retain the urine in the bladder, and may occur during the day or night, or both. It is a common disease of both sexes. The most obstinate cases are those that have continued from infancy, while those that occur during childhood are, as a rule, less obstinate. This condition requires a thorough examina-

tion in every instance, in order to accurately ascertain the actual cause or causes, as there is no fixed or routine treatment that may be employed in all cases.

The examination should embrace the urine, the urinary passages, the spine, habits of diet, etc., as well as the mental and nervous condition. Children should be taught at about the end of the first year, and not later than during the second, how to keep themselves dry both day and night. Incontinence not only occurs in weak and sickly children, but also in those who appear to be in perfectly sound health.

Causes.—This disease may be due to various causes, namely: masturbation, worms, stone in the bladder, a contracted prepuce or foreskin in a male child, epilepsy, or to the enlargement of the tonsils of the nose or pharynx. While it is a known fact that the child is capable of retaining the urine voluntarily during the waking hours, until it is convenient to evacuate same, this control is absolutely lost during sleep. Voiding urine involuntarily occurs, as a rule, while the child is asleep, but very seldom at any other time. During the first few hours of sleep there is rather free urination, but during the early morning hours the voiding of urine is not so frequent.

The child may or may not be awakened by passing water, and it is likely to be repeated night after night, or at least quite frequently for the duration of one week. The interval during which no symptoms occur may be long or short, but they are, however, very likely to recur, and unless the condition receive proper care and attention it is likely to continue for many years. As a rule, it generally disappears spontaneously after puberty has been reached, if it should exist up to that period, though there are instances in which it has persisted as long as to the age of twenty.

Treatment.—In the treatment of this condition it is essential to make sure that the nervous system of the child is developed as steadily as possible, without excitement, over-stimulation, or over-restraint. By sending the child away to spend some time with a friend, the mental effect may be such as to afford greater control over the disarranged centers; but, above all, never punish him. The digestive system should be regulated, and a dose of calomel, given twice a month or every two weeks, will be found highly beneficial.

Should the general health of the child be unsatisfactory, there is no better tonic than cod-liver oil with hypophosphites. Anemia and other forms of debility must be suitably treated.

Among other remedies that have been found very beneficial are liquid extract of ergot, dose half a dram; fluidextract of sweet sumach, dose ten drops.

If the urine is acid, concentrated, and dark in color, and therefore capable of irritating the bladder and urinary tract, the following is useful:

℞ Citrate of Potash one dram
Sweet Spirits of Niter one-half ounce
Water, enough to make four ounces
Mix.
Dose: One to two teaspoonfuls every five hours until the urine becomes clear.

As soon as the urine is clear and neutral, that is, no excessive acid being present, tincture of belladonna is to be given, as described later. This may be determined by the litmus-paper test. If acid is present, it will turn the blue litmus-paper red if it is saturated with the urine. If, upon dipping the blue paper into the urine, the color remains the same, no acid is present.

When the urine becomes clear, after a few days of the above treatment, about five drops of tincture of belladonna may be added to each dose of the above mixture; the dose of belladonna must, however, not be increased, as it may otherwise make the urine concentrated, which would be the direct opposite result of that desired.

In some cases the urine is concentrated and has an ammoniacal odor; if so, urotropine or uritone may be given as follows:

℞ Urotropine three drams
Water, enough to make six ounces
Mix.
Dose: One teaspoonful in half a glassful of water, three times a day.

Or:

℞ Benzoate of Ammonia four-grain capsules
Dose: One capsule three times a day, after meals.

Both of the above remedies acidify the urine and render it antiseptic, and should therefore not be given if the urine is already acid.

In some cases incontinence of urine is not so much due to irritability and weakness of the bladder as to weakness of the spinal centers which govern the bladder, and this area, as shown by the shaded lines in the accompanying figure, should be massaged once or twice a day. In such cases, the urine should first be made neutral as explained above.



The following mixtures have all been found useful:

℞ Fluidextract of
Sweet Sumach four drams
Simple Syrup six drams
Water, enough to
make four ounces
Mix.
Dose: One teaspoonful three times a day.

Or:

℞ Benzoic Acid two drams
Cinnamon-water six ounces
Mix.
Dose: One teaspoonful three times a day.

Or:

℞ Muriated Tincture of Iron one ounce
Tincture of Spanish Fly one-half ounce
Mix.
Dose: Three drops for each year of the child's age, three times a day.

Or:

℞ Fluidextract of Ergot four ounces
Dose: Ten to fifteen drops three times a day.

Dandelion.—Letting the child drink freely of cold dandelion tea or cherry-bark tea is often beneficial.

Sweet Sumach.—Ten drops of the fluidextract of the roots and

bark of sweet sumach, given three times a day, is very beneficial. It is best given in half a wineglassful of water to which a few drops of glycerine have been added.

The treatment of incontinence of urine, summarized, is as follows: Remove any source of irritation in the urine or urinary passages, regulate the diet, make it possible for the patient to sleep soundly, build up the nervous system, and, above all, do not scold or punish the child. Scolding or whipping is the most unfortunate treatment that can be applied; it never does good, and the fault being beyond the child's control, the unjust punishment makes him sullen or else nervous, thus making the trouble worse.

PYELITIS

Definition.—Pyelitis is an affection of the kidneys which is marked by a condition of suppuration, or the formation of pus, in the kidneys, thus producing pus in the urine. It is due to inflammation of the pelvis of the kidney, which is connected with the ureter.

Causes.—In most cases the infection would seem to be derived from the intestine, the germ of bacillus coli being found in the urine. It is the opinion of a distinguished specialist that the bacilli coli, or germs in the colon, travel up the urethra, especially in female infants, from the stools, and cause cystitis, or inflammation of the urinary bladder, at first, and later, pyelitis.

Symptoms.—Pyelitis in infants is a very peculiar affection and is characterized by high and irregular fever, rigors, and pyuria, or the discharge of pus with the urine. Rigors or chills are almost sure and unmistakable symptoms.

Treatment.—The treatment consists in administering alkalies freely. Give an infant twelve months old five grains each of the citrate and the bicarbonate of potash, three times a day. If necessary, increase the dose, as the object is to render the urine alkaline, which causes improvement to set in. If the urine be alkaline, give benzoate of soda in doses of four grains. Urotropine is also a very valuable drug in this affection, and may be given in doses of one to two grains, every three hours, to an infant twelve months old. Scurvy is sometimes a cause of pyelitis in infancy, and in such a case an anti-scorbutic treatment is the proper one and therefore must be employed.

CRETINISM

Definition.—This is a congenital disease which is characterized by absence of the thyroid gland, diminutiveness of size, thickness of neck, shortness of arms and legs, prominence of abdomen, large size of face, thickness of lips, large and protruding tongue, and imbecility or idiocy. It occurs endemically in the goitrous districts of Switzerland and sporadically in other parts of Europe and in this country.

Causes.—This is a peculiar form of nervous affection which develops among children in certain localities, presumably on account of conditions in the atmosphere. Possibly it arises from the geographic situation and conditions. It may also be connected with hereditary tendency or predisposition, as well as unsuitable diet. Others claim that lack of the secretion of the thyroid gland is the cause.

Symptoms.—Among its peculiar manifestations is not only feebleness of mind but lack of development of the entire body. There are also deformities of the bones, changes in the thyroid gland, which is the gland in front of and on either side of the trachea or windpipe, and a swollen condition of the skin. It is supposed by some specialists that the defect in the thyroid gland is the cause of most of the peculiarities of the mind and body. It is very rare that the affected child reaches middle age. There are also lethargy and quietness, a slight puffiness about the face, a fullness of the tongue, prominence of the abdomen, and constipation. These symptoms are likely to appear, in the case of bottle-fed babies, within the first two months. If an infant whose thyroid gland does not perform its functions actively should be breast-fed, the symptoms do not usually appear for some months after the weaning.

Treatment.—The treatment, which should be commenced early, consists of small doses of thyroid gland, various preparations of which are on the market, but the dried extract is the most convenient form and appears to sufficiently meet all requirements. In the case of infants under six months, a beginning may be made with one-sixth or a quarter grain of the dry extract per day. Small doses at the beginning are necessary at this age, because diarrhea and other symptoms of poisoning may be easily

contracted in certain patients by large doses, where such patients are susceptible. Such diarrhea is likely to prove uncontrollable and may be fatal.

CONGENITAL SYPHILIS

Definition.—By congenital syphilis is meant the inherited form of syphilis—in other words, that which exists at birth.

Cause.—The only cause is that either the father or the mother (not necessarily both) is afflicted with the disease.

Transmission.—The most striking feature in the family history of syphilis in children is the frequent absence of any symptoms of the disease in the mother. No explanation of why a mother in such cases is immune has ever been given. The fact that a mother who has shown no symptoms of syphilis may nurse her infant who has congenital syphilis without fear of becoming infected, while a wet-nurse would be infected by the same infant, seems to show that the mother has somehow acquired immunity. This would indicate that a father can beget a syphilitic child without giving the disease to the mother. As far as the appearance of actual symptoms is concerned, this is undoubtedly true; but in practically every such case the mother has nevertheless become infected, as her blood will show a positive reaction with the Wassermann test. The various modes of transmission may be summed up as follows:

1. Father syphilitic; mother apparently healthy.
2. Father and mother both show symptoms of the disease.
3. Mother syphilitic; father healthy.
4. Mother acquired syphilis during pregnancy.

Another curious fact for which there is no explanation is that occasionally the disease may be absent in one child and reappear in a later child. There are cases on record in which one of twins is healthy, while the other has congenital syphilis.

Congenital syphilis rarely manifests itself at birth, but in about fifty per cent. of all cases the disease shows itself within one month after birth; another thirty per cent. show symptoms during the second month; and about fifteen per cent. during the third month. Cases that develop symptoms as late as one year

after birth are rare, and there are practically none on record which developed symptoms of the disease two years after birth.

Symptoms.—*Marasmus* is noticeable in a greater or less degree in a large majority of syphilitic infants; in its gravest form it frequently dates from a few days after birth. A progressive form of marasmus often begins before any other manifestations of syphilis have appeared, and continues even after associated symptoms of syphilis have disappeared under mercurial treatment; the wasting is entirely independent of any fault in feeding or irregularity of the bowels.

Snuffles.—Snuffling occurs almost always in the first three months, usually within the first six weeks. It is present in about seventy-five per cent. of all cases, and varies from slight stuffiness of the nose up to a profuse discharge of pus which is often blood-stained.

Skin Eruptions.—These generally appear soon after the snuffles, and almost always within the first three months, although they may in isolated cases not appear until six months and even one year after birth.

Enlargement of the Spleen.—This occurs in many cases; it is, however, no positive evidence of the presence of syphilis, nor does its absence weigh against the diagnosis.

Laryngitis.—This is one of the most frequent of the early symptoms; it occurs usually after the onset of the snuffles or rash. A hoarse aphonic cry in an infant under the age of three months always suggests the possibility of congenital syphilis.

Orchitis (*Inflammation of the Testicle*).—This is often a symptom of the disease; the testes are enlarged to two or three times the normal size.

Eye Affection.—This is a striking feature in all nervous affections of congenital syphilis; it shows itself in inflammation of the cornea, inflammation of the iris, and inflammation of the choroid coat of the eye. It usually begins in one eye several weeks before the other is affected.

Anemia.—Toward the end of the first year, anemia of a very profound degree is often a result of congenital syphilis; extreme pallor of the face, with a brownish-yellow tinge about the nose and cheeks, is a very striking symptom.

Teeth.—In later childhood characteristic changes of the teeth occur. The upper central incisors are chiefly affected; they are unduly small and widely separated. They are of abnormal shape, the cutting edge is usually narrower than the base and its corners are round instead of angular, but the shape of the edge is most characteristic; it shows a crescentic notch.

Contagion.—As stated before, there is practically no case on record in which a mother has contracted the disease from her baby while nursing him. On the other hand, a wet-nurse will almost always become infected with the disease when nursing an infant afflicted with inherited syphilis. This raises the question as to what extent congenital syphilis is contagious. On this point there is a wide difference of opinion. There is, however, no doubt that congenital syphilis has infinitely greater power of contagion than the acquired form, and that hundreds of thousands of cases of syphilis have had their origin in innocent babies, although by some authorities it is claimed that the virulence of such contagion has been grossly overestimated.

Treatment.—In all cases constitutional treatment should be adopted, and the drug on which most reliance can be placed as a specific of incalculable value is mercury. In a vast number of cases the improvement which follows the employment of this drug is literally phenomenal. The facts of greatest importance to be borne in mind are: the drug must be given in sufficiently large doses; it must be continued for a long time; and it must be combined with particular attention to the general health. No drug gives such striking and marvelous results in congenital syphilis as mercury. This is true even in many cases that have been apparently hopeless. Many children suffering from this disease, if treated in the manner recommended, will at the end of about twelve months be thoroughly well developed and in comparatively perfect health. There are very rare cases of peculiarity of temperament or idiosyncrasy in which mercury is not well borne. It may happen that the elimination of the disease will not be thorough if syphilitic inflammation of the kidneys be present, in which case symptoms of poisoning will arise. In such cases it is advisable to employ only very small doses of mercury; but in a well marked case, however young or delicate the infant may be, it is safe to commence with one grain of

mercury with chalk, three times a day, as is specified in the following:

℞ Gray Powder (Mercury with Chalk) twenty-four grains
Bicarbonate of Soda forty-eight grains
Mix, and put into twenty-four capsules.
Dose: One capsule three times a day.

This can be safely given to an infant a few weeks old.

The value of the soda consists in checking any irritation which may result in the alimentary canal, but whether or not this constitutes an actual danger in infants admits of doubt. Instead of bringing on diarrhea, the mercury occasionally causes constipation. In milder cases, and when the child's nutrition shows that there are no constitutional effects, the dose should be reduced to half a grain of gray powder to two grains of bicarbonate of soda, three times a day.

Mercury, as a rule, is so well borne by infants and children that there are very seldom cases of symptoms from over-dosage. There is a distinct advantage in giving mercury by way of the mouth rather than by inunction or anointing, and that is, that in the former method the exact amount that goes into the system is definitely known, whereas in the latter it is not possible to know. A further advantage lies in the local effect that mercury has on the alimentary canal, as it stimulates the secretions and frequently removes some of the harmful results of improper feeding. Anointing with mercury is, however, not without some value. Half a dram each of blue ointment and lanolin may be rubbed into the abdomen every morning after the bath and then covered with a flannel binder. This must remain on until the next following morning, when, after the bath, a fresh amount is applied as before. The binder should not be changed too often, as the saturation with the drug aids in producing the impression upon the system. The ointment should be thoroughly rubbed into the skin, so that the skin will absorb as much as possible. In case there be signs of irritation, which is likely to occur in infants with delicate skins or in those suffering from a rash, it is advisable to change occasionally the spot on which the ointment is rubbed, say to the armpits, the back, or the thighs. In some severe cases in which quick results are necessary, it will

be very advantageous to employ both methods of treatment, that is, by the mouth and by anointing.

There are in vogue various other methods of administering mercury, namely, one sixth to one eighth of a grain of calomel three times a day, or ten to twenty drops of the perchloride of mercury three times a day; but they do not in any way surpass, in point of beneficial effect, those already mentioned and described.

The length of time that the mercurial treatment should last will vary with the patient's condition, both locally and generally, but in many cases it is discontinued too soon. The dosage administered at the beginning may be continued with advantage for three months, and if during that time symptoms of mercurial irritation should appear, reduce the dose by one half. After three months of treatment, give smaller doses and only at intervals.

One half of the dose given at the beginning may be administered for a week and given at an interval of a week. Continue this method for nine months, and if active signs of the disease should reappear during this period, resume the full dose and give it continuously. At the expiration of twelve months of treatment, if there should be no active signs of the disease during the last six months, the child may be considered as cured, so far as the term cured is applied to syphilitic cases. It implies that in all likelihood no immediate symptoms of the disease will appear, but that they will not reappear later is a matter that cannot by any means be guaranteed. Infants who are affected with syphilis require also very careful treatment in the matter of diet and hygiene, for while some of them are well nourished and seem to be in fairly good health, they are only exceptions. The majority are wasted, puny infants with weak digestion, defective powers of assimilation, and rather poor nutrition. Such patients must not be fed on full diet, as the results will be quite disastrous and the condition will be aggravated. The food should be simple and easily digested. Therefore peptonized milk, whey, albumen water, and raw meat juice will be found highly serviceable until the general health has been restored. One to two drops of the tincture of nux vomica, given three times a day, will be of material benefit.

In children who have passed the age of infancy, the general

health must be supported by medicinal and dietetic measures. In all cases the successful management of the malady makes a plentiful supply of fresh air and sunshine, warm clothing, rest, and sleep indispensable requisites. It is also likely that anemia of a very marked species will be present, and the best treatment for such a condition is the addition of raw meat juice to the diet, say one to two drams to be given three times a day. Do not administer iron until the organs of digestion are in a perfectly healthy condition, and mercury will invariably be quite sufficient to remove the anemia thoroughly. In other cases, great benefit will be derived from the administration of the saccharated carbonate of iron in small doses of from one to two grains twice a day, with the gray powder.

The steady and continued wasting which is met with so often in this malady does not make it necessary to discontinue the use of mercury; on the contrary, it should be continued in steady use, but the fact that the patient's nutrition must be improved by proper and suitable diet must not be overlooked.

Salvarsan, or 606.—While cases have been reported in which injection of this drug into the nursing mother was followed by rapid disappearance of symptoms of syphilis in her breast-fed infant, this mode of indirect treatment through the mother is highly unsatisfactory, as it is impossible to regulate with accuracy the dose received by the infant. If salvarsan or neosalvarsan is used at all, it is advisable to administer it directly to the infant; for this purpose, doses varying from one third to one grain of salvarsan should be injected. The injection of either salvarsan or neosalvarsan in infants is, however, not without great danger; many fatal cases have been recorded from its use. It therefore hardly seems expedient to use so painful a procedure when we have an efficient remedy in the administration of mercury by the mouth or by rubbing the mercurial ointment into the skin.

Syphilitic Rhinitis.—Syphilitic rhinitis, popularly known as the snuffles, is likely to impede the breathing and feeding of the infant on account of the extent of obstruction in the nostrils. An irritating discharge is often present, and it causes an abrasion of the skin about the nostrils and upper lip. In such a case the nostrils must be very carefully cleansed by irrigation, that is to say, must be washed out by means of a stream of warm boracic

acid lotion, so as to remove all crusts, blood, and mucus. It is advisable and quite necessary to protect the entrance to the nostrils, as well as the skin around, with white precipitate ointment (ammoniated mercury), consisting of one part of ointment diluted with nine parts of vaseline. This course should be carried out twice a day and oftener, if the nasal obstruction should be at all marked.

Syphilitic Ulcers.—One of the very prominent and characteristic features of this affection is the appearance of numerous clearly defined superficial ulcers at and around the anus. If these be neglected they are likely to spread over the buttocks, across the perineum, the scrotum, or the vulva, and down the thighs, and they may unite and form large ulcers. It is of great importance that special care be taken to protect these regions by preventing any soiled or wet diapers from remaining in contact with them. After the infant has voided urine, or has had a movement, wash the buttocks with warm water, dry them thoroughly, and dust with a powder consisting of equal parts of starch and calomel. This will cause the ulcers to heal rapidly. If fissures or small warts appear about the anus, apply the powder thoroughly to these injuries and pass a small quantity of diluted white precipitate ointment (one part ointment to nine parts of vaseline) inside the bowel.

Epiphysitis.—A lesion or hurt which is also a very characteristic feature of this disease is epiphysitis, or inflammation of a piece of bone growing upon another, which is usually detected at first by the presence of pain in the affected limb when handled or moved. On account of the pain the infant does not move the limb voluntarily. As a consequence, there is a development of a condition which bears a very close resemblance to paralysis, and which is termed pseudo-paralysis. The long bones of the upper limbs are more frequently affected than those of the lower, and the condition may involve both sides or affect only one side. This disease does not occur after the age of six months, and the great majority of cases are found during the first three months; therefore, on account of the age, scurvy may be excluded from consideration as having any connection with the affection, and the only disease with which this condition may be confounded is septic epiphysitis, or putrefaction of a bone growing upon another. The latter is accompanied by fever and disturbances in

the constitution, which are not present in syphilitic epiphysitis.

Treatment.—The treatment, in addition to the internal administration of mercury, consists in applying mercurial ointment and the fixing of the limb in a splint. Spread one ounce of the ointment over lint and apply to the affected arm or leg. Then mold a porous plaster to the limb and pad it. Fix the arm at a right angle, or, in case of a leg, place the leg in an extended position. Continue this dressing for one week, and keep the limb carefully at rest. At the expiration of the week the limb will probably be moved freely. All trace of the effusion or discharge of the fluid will have passed away after another week of the same treatment.

The local treatment by means of mercury seems to exert a very beneficial influence and to give remarkably satisfactory results, as it is the experience of a very distinguished specialist that while epiphysitis has developed under the administration of mercury by way of the mouth, it has been controlled by and yielded rapidly to anointing with mercurial ointment.

BOILS

Causes.—They are usually due to an impoverished state of the system, although in some cases, such as in paraffine or oil workers, they may be due to local causes.

Treatment.—The constitutional treatment consists of fresh air, cod-liver oil, arsenic, iron, phosphate of sodium, etc.

The local treatment consists of the abortive and curative methods. The abortive method consists of painting the inflamed spot, as soon as the boil forms, with collodion (guncotton), and renewing the coat every hour until a heavy covering is formed. The center of the swelling is, however, to be left untouched by the collodion. If the pus which may form is not absorbed and the boil comes to a head, it must be opened and properly dressed with antiseptics.

The exudation from a boil, if coming in contact with healthy skin, is very apt to cause a boil to come in that place; therefore it is essential that the boils be kept well covered by gauze and a plaster, so as to prevent the matter from coming in contact with other parts of the skin. After the core comes away, wash

the boil with an antiseptic solution and cover with ichthyol ointment, aristol ointment, or similar preparation.

The belief that one boil will cause six others to come before they disappear entirely, is erroneous; if care is taken and the sore thoroughly disinfected, there is no reason why one boil should bring on another.

Camphorated Oil.—This is valuable in the early stages. Wipe the surface dry and smear camphorated oil over the inflamed area; cover with gauze.

Or:

℞ Ichthyol one dram
Lead Plaster two drams
Rosin Plaster two drams
Mix.
Directions: Apply to affected part.

Carbolic Acid.—Injecting a couple of drops of a five-per-cent. solution of carbolic acid into the boil when formed will prevent it from coming to a head and cause it to disappear. A simple way of using the carbolic acid is to wrap a little absorbent cotton on a sharp stick, such as a toothpick; dip this in the solution and bore into the core of the boil. Care must, however, be taken not to go deeper than the base of the pus cavity. After this application, wash off the boil with peroxide of hydrogen and apply a ten-per-cent. ointment of salicylic acid.

A useful pain-relieving dressing is:

℞ Iodoform four grains
Menthol two grains
Vaseline one dram
Mix.
Directions: Smear on lint and apply.

The above is also very valuable in cases where boils form in the external ear canal. The canal of the ear is to be syringed several times a day with hot water. When the boil has come to a head, it must be opened. The above ointment, if smeared on a pledget of cotton and inserted into the ear, will relieve the pain; renew two or three times a day.

Spirits of Turpentine.—If applied in the *early stage,* before any pus forms, spirits of turpentine will usually cause the boil to disappear without coming to a head.

Lime-water.—Drinking plenty of lime-water will give considerable relief.

Camphor.—Saturate a linen pad with spirits of camphor or camphorated oil, and apply over the boil; cover with a strip of adhesive plaster.

Flaxseed Poultice.—A flaxseed poultice will bring the boil to a head.

To purify the blood, take a cream-of-tartar and sulphur lozenge several times a day.

Or:

℞ Cream of Tartar one ounce
Flower of Sulphur two ounces
Molasses one pint

Mix.

Dose: One to two teaspoonfuls morning and evening.

The injection of staphylococcic vaccine should be resorted to if there is a successive crop of boils which will not yield to ordinary treatment.

EARACHE

Infants and young children are sometimes afflicted with this painful malady, the child crying if pressure is applied with a finger just in front of the ear.

Treatment.—Irrigating the ear canal with a tepid solution of one teaspoonful of boracic acid to three ounces of water, using a blunt ear-syringe for the purpose, is very beneficial.

Heat.—Covering the ear with a layer of cotton or linen and applying a hot-water bottle, or any other means of applying heat, such as a bag of hot salt, hot flannel, etc., will always have a beneficial effect.

Baked Onion.—Place an onion in an oven and bake thoroughly. Remove the core of it and gently place, while still warm, in the ear canal; it is an old remedy and said to be very effective.

In case of a dull ache which is often caused by a collection of wax in the ear canal, irrigate the ear with a warm solution of water to which enough lysol has been added to make it look cloudy and soapy. Or, drop warm olive-oil into the ear in the evening, and irrigate it in the morning with warm water.

Discharge from the Ear.—If there is a discharge from the ear, one of the best remedies is to irrigate the canal with a solution of half a teaspoonful of lysol to half a glassful of warm water. Use a blunt-nozzle ear-syringe for this purpose. After irrigating, dry carefully with a little absorbent cotton on a stick, and then dust a little powdered boracic acid into the ear canal; for this purpose a medicine-dropper may be used, which must, however, be thoroughly dry. Suck a little of the powder into the dropper, insert the nozzle just inside the ear, and compress the rubber bulb quickly; the powder is thus blown into the ear canal. Repeat each evening for a week; thereafter, twice a week for a few weeks.

If relief is not readily obtained, have a physician examine the drum for pus in the middle ear, which, if present, must be incised and drained. Serious complications, such as mastoiditis and meningitis, may occur if this is neglected or not properly treated.

GLANDULAR FEVER

Definition.—This is a condition which occurs in little epidemics, especially in autumn, among children living in one household or at school together.

Causes.—It appears to be due either to some error in diet or to some irritation of the throat, for example, by inhaling air contaminated by bad drains.

Symptoms.—The glands of the neck, especially of the left side, become, in the course of a day or two, much enlarged and tender, and at the same time there is fairly high fever, and the child loses all appetite for food. The child remains ill for about a week and then the glands slowly subside. This trouble is very often mistaken for mumps, a condition in which the salivary glands are inflamed.

Treatment.—The child should at first be confined to bed, and as constipation is generally present, a dose of castor-oil may be given. The neck should be kept warm and still by a flannel bandage and absorbent cotton, but no further application is necessary, as the glands rarely suppurate. Tonics and careful feeding are necessary afterward, since the general health is a good deal depressed.

The following will be found beneficial:

℞ Syrup of Iodide of Iron one tablespoonful
Peppermint-water three ounces
Dose: One teaspoonful three times a day.

HEADACHE

Headache in children is generally caused by constipation or dyspepsia.

Ice-bag.—An ice-bag applied to the head will often relieve.

Mustard Bath.—Give the child a hot mustard foot-bath (one tablespoonful of mustard to each gallon of hot water), and at the same time give an emetic of two teaspoonfuls of wine of ipecac.

Laxatives.—It is always well to give a child complaining of headache a purgative to move the bowels. This may be of a saline nature, such as Epsom or Rochelle salts, or castor-oil. If the liver is inactive, give a dose of calomel at night, and follow with a saline purgative in the morning.

If headache is due to eye trouble, as often is the case in children of school age, a thorough examination of the eyes should be made by an eye specialist and the trouble corrected.

SCALD-HEAD—MILK-CRUST—FAVUS

This is a form of eczema, and usually due to uncleanliness of the scalp. The patches may be removed by soaking them with olive-oil, which should be gently rubbed in with the tips of the fingers; allow this to soak in well and follow with warm water and soap. If the trouble is very bad, apply freely a two-per-cent. resorcin ointment; bandage the head with linen or cover with a cap. Renew the ointment daily for three or four days, but do not wash the head in the meantime. After the last application has been on the head for a day, clean the scalp by soaking it well with warm olive-oil (do not use soap and water), and the crust can readily be removed.

LICE AND VERMIN

While these are usually due to uncleanliness, still any child may at times become infected with them through contact with other children, at school, in public conveyances, etc.

There is considerable itching of the scalp, and upon investiga-

tion the nits (eggs) will be seen attached to the hairs. A fine comb may be used for removing the nits. For killing the lice themselves, larkspur is the best; it is to be used as follows:

Larkspur.—Apply either the tincture of larkspur or ointment of larkspur seeds to the scalp, rubbing it in well. Let this remain on overnight, and in the morning use a fine comb; if there are still lice to be found, repeat the treatment the next evening, and on the following morning shampoo the head with warm water and Castile soap. If after this treatment any nits remain on the hair, washing it with vinegar will remove them.

Kerosene Oil.—If larkspur tincture or ointment is not at hand, kerosene oil may be used instead, but great care must be taken not to get near a fire or open flame.

Oil of Sassafras.—The oil of sassafras is also excellent if rubbed into the scalp the same as larkspur or kerosene; in fact, many prefer this treatment to either of the other two remedies. A little of this oil rubbed behind the ears and on the nape of the neck will prevent lice from getting on the head, as the odor seems to be disliked by them.

While applying any of the above remedies, a wet towel or handkerchief should be placed around the neck so as to prevent the lice from escaping.

PRICKLY HEAT

Definition.—This is a condition to which the white races residing in warm or tropical countries are particularly liable, but an analogous condition is not uncommonly met with in more temperate climates during the summer months. The condition is associated with excessive sweating, especially when suddenly induced by exertion, and it consists in the development of numerous tiny red pimples, which go on in a very short time to the formation of small vesicles or blisters. It is exceedingly itchy, and, if recurrent, may pave the way for a wide-spread attack of eczema.

Cause.—It is usually due to too warm clothing during the hot months of summer. Linen underclothing will usually prevent the irritation.

Treatment.—In the treatment of this rash, the cause must first of all be removed.

To relieve the itching, the irritated skin should be sponged with a solution of one teaspoonful of bicarbonate of soda or saleratus to a pint of water and allowed to dry without wiping off. Dusting the irritated skin with corn-starch, talcum powder, or rice-starch usually gives relief from itching.

Do not use soap or salt in the bath if a child is troubled with prickly heat. Oatmeal or bran tied in a cheese-cloth bag and put in the bath is very beneficial and soothing.

A dose of castor-oil should be given, and the diet should be very light, so as to cool the overheated body until the rash has disappeared.

To cool the blood, give the child the following mixture:

℞ Cream of Tartar two ounces
Flower of Sulphur two ounces
Mix.
Dose: One-half teaspoonful morning and evening for a few days.

CHAPPED HANDS AND FACE

The following treatments have all been found beneficial:

Glycerine and Rose-water.—Apply this mixture freely; it usually will make the skin soft and pliable. There are some skins to which glycerine is irritating; a trial will soon tell.

Glycerine and Lemon Juice.—Use one third lemon juice to two thirds glycerine; mix well and rub into the skin at night.

Camphor Ice.—Wash and dry the skin thoroughly, and apply camphor ice freely, several times a day.

Carbolated Vaseline.—Rub thoroughly into the skin at night; if used for the hands, cover them with loose kid gloves, which should be kept on for the night.

Zinc Ointment.—For chapped lips there is nothing better than zinc ointment. Apply at night.

ECZEMA

The following mixtures have all been found very useful in the treatment of this trouble:

Calomel and Lard.—Mix one teaspoonful of calomel with one tablespoonful of lard or lanolin; bathe the affected area with olive-oil and apply the ointment.

Oxide of Zinc and Starch.—Mix equal parts of powdered starch and oxide of zinc; bathe the affected area with olive-oil, and dust the powder over it.

Sulphur and Lard.—Mix two teaspoonfuls of sulphur and three teaspoonfuls of lard, and apply to the affected parts.

White-pine Tar and Lard.—Mix equal parts of these and apply as an ointment.

Or:

℞ Prepared Calamine one-half dram
Glycerine one-half dram
Oxide of Zinc one-half dram
Lime-water three ounces

Mix.

Directions: Apply frequently to the area affected.

Or:

℞ Carbolic Acid one dram
Prepared Calamine one dram
Zinc Oxide two drams
Lime-water four drams
Glycerine four drams
Rose-water four ounces

Mix.

Directions: Apply several times a day to the affected skin.

In cases where children suffer from a dry form of eczema which seems to resist all treatments, use the following mixture:

℞ Oil of Tar one-half dram
Precipitated Sulphur one-half dram
Zinc Oxide Ointment one ounce

Mix.

Directions: Apply over affected area, morning and evening.

FUNCTIONAL NERVOUS DISORDERS

Disorders of the nervous system comprise a class of affections to which children are, for the most part, peculiarly liable. There are some children in whom the nervous balance is not disturbed temporarily or even occasionally, but who appear to be suffering from a chronic condition of nervous unsteadiness and excitability. For example, they are characterized by unusual emo-

tionalism, activity, restlessness of body during the day and of brain at night, premature general development, whimsicalness, fickleness, at one time passionate and at another affectionate, and they seem to be the barometers which indicate the reign of peace, comfort and happiness at home. They appear to be constantly between the frontiers that divide health and disease, never decided on even a temporary abode on either territory, but just hovering over the boundary-line.

Whenever they have an acute attack, the manifestations which they present are quite out of the usual, and the mode in which they respond to drugs is a veritable puzzle. This nervous predisposition, or diathesis, is shown in a variety of ways, one of which is local disturbance of function, being known as neuroses, or hysterical manifestations, which are likely to assume different forms, such as functional aphonia, or loss of voice; functional tremor, or spasmodic contraction of one limb; functional paraplegia, or paralysis of the lower extremities; functional disphagia, or difficulty in swallowing; and functional spinal or hip disease. The attack may follow some marked illness or injury, and sometimes a shock or fright, while in other cases there is no seeming exciting cause. A child may become predisposed to such functional disturbances by heredity or by acquiring them.

A history of nervous diseases, of rheumatism, or gout, in one or both parents, will often be found. The tendencies that are acquired depend on the special constitutional predisposition of the child, influenced by its diet, its general domestic environment, as well as its rearing. Although there are forms that present themselves at an early stage of life, yet, as a general rule, such hysterical manifestations as those mentioned occur rather frequently during later childhood, say from the age of nine to that of fourteen.

Treatment.—That part of the treatment which is most difficult is the removal of the child from its parents and home attachments and surroundings. The home treatment usually consists of indulgence of the caprices of the child, an excessive outpouring of sympathy, and overfeeding. Therefore it is almost impossible to carry out at home any steady and definite line of proper and suitable treatment. Next to separating the child from its parents, the best thing is to commit it to the charge of a trained nurse and to lay down for her observance a strict and prescribed line

of conduct which she is to pursue in the care of the child. It is advisable to encourage the child to use its mind and body, but it must be discouraged in talking about its diseases and sufferings, and its mind must be directed to and kept engaged on pleasant and amusing topics.

Employ massage when the system is run down and the muscular power weakened; it is especially efficacious after cold bathing or cold sponging. In all cases of general weakness great benefit is derived from electricity of the Faradic form. It should be employed mildly at first, as a general tonic, but a stronger current is often necessary locally, so that the stimulus of pain may be added to that of muscular action.

In the employment of any of these measures, care must be taken not to frighten the child, so as to avoid increasing the nervous disturbance already present. It is quite feasible, however, to execute strong and exacting measures without doing the slightest injury, if only patience, gentleness, and firmness be employed. The nervous system must be braced and strengthened by plain and non-stimulating diet in abundance and a good deal of open-air life. Do not burden the child with lessons, as excessive study is unduly exciting to the nervous system. Nerve tonics, such as nux vomica, strychnine, and cod-liver oil with hypophosphites, are also very useful. A private school having a limited number of pupils is best suited for such cases, as each child is more likely to receive that special care and attention which such cases demand. Care must be taken, however, not to regard and treat the child as being delicate, and it is highly advisable to inculcate in it the principles of self-control.

It is important to bear in mind that, on account of the relapses that are so common among children of this type, careful attention must be given to the general treatment of the child, and not simply to the curing of an attack. The greatest importance is attached to the treatment of various local manifestations. Functional aphonia, for instance, can be rapidly cured by the Faradic form of electricity, by placing one pole on the back of the neck and the other over the larynx. The strength of the current should be gradually increased until the patient has cried out and he can then be induced to utter some words in a clear tone of voice. He must be encouraged to do this, and in case the voice should fail again, the battery must again be employed.

Massage and electricity are very valuable agents in paralytic injuries of the extremities, and in cases of the legs it will often be found that the patient can exercise his limbs rather powerfully while in bed, but as soon as he has made an attempt to stand or walk, all muscular power disappears. The use of the legs while the patient is in an erect position can, however, be steadily improved by encouraging and supporting him.

Functional tremor is usually confined to one limb and is present only while the patient is under observation. The application of the Faradic form of electricity locally until pain has been produced, usually tends to effect a cure.

INFANTILE PARALYSIS—POLIOMYELITIS

Definition.—Infantile paralysis is a form of spinal paralysis most commonly confined to one limb, and occurs in children occasionally. It is caused by an inflammatory affection, which is limited to the front portion of the gray matter of the spinal cord, and therefore affects the function of motion, leaving the function of sensation quite unimpaired and unaffected. This affection occurs most commonly during the period of first dentition, although, strange to relate, a similar affection is occasionally observed in adults. It may begin with an insidious attack, or frequently there may be an acute febrile attack which lasts for several days. There are few diseases which, within so few hours or days, may so completely mar a life by permanent and hopeless crippling as does infantile paralysis.

Causes.—The specific cause of infantile paralysis is a minute microörganism, a so-called virus, capable of cultivation. In the human body the virus has been found: first, in the tissues of persons dead of poliomyelitis, namely, in the brain, spinal cord, mesenteric glands, tonsils, and the mucous secretions of the naso-pharynx, trachea, and intestines; second, in the secretions of persons acutely ill with the disease; third, in the naso-pharyngeal and intestinal secretions of convalescent patients; fourth, in the naso-pharyngeal secretions of apparently well persons who have come more or less intimately in contact with patients suffering from the disease in epidemic form.

Experimental evidence points to the conclusion that infantile paralysis is a contagious disease, spread from person to person

through interchange of infectious secretions, the sources of infection being the acute cases of poliomyelitis, the convalescents, the passive human carriers, and possibly also through the agency of a biting fly (*Stomoxys calcitrans*) and the bedbug. In epidemics, children under five years of age are attacked much oftener than older persons, and in adult life there is a very general immunity to the infection; the reason for this is at present still a matter of speculation.

Symptoms.—In either case, paralysis comes on first, in many instances, in a rather extensive manner, involving both upper and lower extremities, tending to become soon more limited and confined to one or more limbs, or even to a group of muscles. The muscles affected lose their power of contracting when under electricity and are likely to waste. For this reason the limbs become shortened, shriveled, and useless, producing oftentimes deformities, such as, for instance, a club-foot.

Fortunately, however, the disease is rather limited in many cases, and the prospect of improvement is good if the muscles give indication of any reaction in response to the application of electricity. The paralysis is not progressive, and when its limits have become clearly defined within a few days of the attack, it is safe to assume that there will be complete recovery in so far as the other parts are concerned. The general rule as regards the paralyzed parts is that great improvement takes place but recovery is incomplete.

For some reason the part of the spinal cord remote from the brain is affected most often and most severely. Observation shows that in 100 cases:

Left lower limb paralyzed in	32
Right lower limb	23
Both lower limbs	16
Both lower and both upper limbs	6
Both lower and right upper limb	2
Both lower and left upper limb	1
Right lower and right upper limb	1
Right lower and left upper limb	2
Left lower and right upper limb	1
Left lower and left upper limb	1
Both upper limbs	2
Left upper limb	5
Right upper limb	8

It will be seen that the lower limbs, one or both, were the only part affected in 71 out of 100 cases; that the lower limbs were affected together with the upper in 14 cases, and that the upper limbs alone were affected only in 15 cases.

These figures refer to the permanent paralyses, but it must be remembered that during the few days or weeks following the onset of the disease there is often much more extensive paralysis, which clears up, leaving, it may be, only one limb or one group of muscles affected.

Some of the more distressing symptoms of paralysis of the lower extremities are entirely absent, namely, disturbances of the bladder and bowels, or extensive bed-sores. The health of the child is not, as a general rule, materially affected. The disease rather resembles the nature of an infectious malady, caused by an ultra-microscopic germ, which affects only this part of the nervous system.

Occasionally epidemics of the disorder occur, affecting several children in a neighborhood, although the disease does not appear to be highly infectious among the children brought into close contact with one another, as in one family.

Treatment.—After the acute stage has passed, attention must be directed to the paralyzed muscles, but they should not be treated until all pain and tenderness have subsided. Paralysis is readily detected when the movements caused by exercise of the child's will bring into action most of the muscles of the body. The muscles of the back, chest, and abdomen should receive special attention, as they are liable to be overlooked.

It is not necessary to keep the child in bed longer than one week after the acute symptoms have subsided, as general nutrition will be maintained more easily when the patient is up and about. The most important part of the treatment is massaging of the affected muscles, and to make this efficacious it is highly essential to secure the services of a trained nurse. The muscles should be massaged twice a day for ten or twenty minutes, though a longer time may be required if many groups of muscles are affected. After rubbing, the affected limb or limbs should be very carefully bandaged in flannel, and absorbent cotton may be added, if found necessary. Warmth of the affected limbs should be well maintained, and special precautions must be taken regarding the treatment of infantile paralysis, due to the coldness

and blueness which follow quite rapidly. One can reasonably expect marked improvement during the first few weeks of treatment, from the fact that many of the muscles are only temporarily affected. The expiration of a month ought to show just which muscles have been more seriously affected by injury to the spine. It is advisable to bear in mind that massage must be persevered in for at least six months, and if at the end of that period the muscles remain unchanged in their condition, it will usually be conclusive proof that further benefit from this treatment is hardly possible. Electricity is frequently combined with the massage feature of the treatment.

Prevention.—During an epidemic of infantile paralysis the child's nose should be sprayed several times a day with a solution of boric acid and water, or a weak solution of salt and water.

Any symptoms of sickness, no matter of what nature, should have the immediate attention of a good physician, and the child should be separated from all other children until the nature of the disease has been ascertained.

The first noticeable symptoms of infantile paralysis are fever, lameness, general weakness, and disturbed digestion. Children must not be allowed to use drinking-cups at public fountains or at soda-water stands. The child should be instructed to wash his mouth out several times a day with a strong solution of salt and water, and in fact the entire face, including the ears, should be bathed with it.

EPILEPSY—FALLING SICKNESS—GRAND MAL

Definition.—Epilepsy is a nervous disorder marked by sudden loss of consciousness, and is attended with convulsions, the paroxysms lasting but a short time. It is a chronic nervous affection not attended with fever. In the spasms, the contractions and relaxations either occur alternately, or there is continuous contraction. An epileptic seizure is usually preceded by a peculiar sensation or warning which is called *aura,* and as the patient falls he sometimes makes an outcry—the *epileptic cry.*

Treatment.—In the treatment of epilepsy it is essential to pay particular attention to any source of irritation far from the nerve-centers, such as nasal obstruction, errors of refraction,

unusual lengthening or contracting of the prepuce or foreskin. The removal of these sources of irritation does not, however, cure the malady, but it does allow other special treatment to be carried out with much better prospects of success. The environment of the home, the diet, hours devoted to sleep and mental work, play an important part and must be regulated with a view to warding off any avoidable strain or disturbance of the nervous centers.

If the child finds pleasure in school life, it may be permitted to continue its attendance, but all mental strain and worry must be strictly avoided. The diet should be simple and wholesome. All substances like tea, coffee, and alcohol must be forbidden, and care should be taken not to overfeed the child. Meat may be used, but sparingly.

As regards treatment with medicine, bromides are generally held in very high repute as being the most reliable, and the dosage must be regulated according to the frequency and severity of the fits. Children stand the bromide treatment exceedingly well, therefore a dose of from ten to fifteen grains of bromide of potassium can, with very great benefit, be given to a child ten years old. When using large doses, it is advisable to employ equal parts of the three bromides, namely, potassium, sodium, and ammonium. A course of this sort will render the medicine less depressing.

When cases are protracted, the treatment should be given at regular intervals. It is advisable to give the daily amount of bromide in one single dose at bedtime, if the convulsions occur at night. If the use of bromide in any of the above forms results in the appearance of acne, which is a very annoying affection, bromide of strontium should be used. It is sometimes necessary to discontinue the treatment when a peculiar and obstinate bromide rash appears in infants and children. There is sometimes evidence of this rash even when the doses given are very small. It is advantageous to combine nerve tonics with the bromide treatment. Strychnine and hypophosphites are considered the best, also cod-liver oil. In some cases the addition of chloral hydrate in full doses increases to a very high degree the efficacy of the bromide, which is of special value when the fits are frequent and severe and the malady is regarded as having reached

an acute stage. Keep the patient in bed, and if he is eight years of age the following may be given:

℞ Potassium Bromide three drams
Infusion Adonis Vernalis four ounces
Distilled water, to make six ounces
Mix.
Dose: One to two teaspoonfuls three times a day.

HYDROCEPHALUS—DROPSY OF THE BRAIN

Definition.—Hydrocephalus is a term applied to two different forms of diseases of the brain, both of which are attended with the effusion of fluid into its cavities. These are named *acute* and *chronic hydrocephalus.*

Acute hydrocephalus was the name formerly used for the disease now generally known as tubercular cerebral meningitis.

Chronic hydrocephalus is a different form of disease from that above mentioned, both as regards its pathology and its effects. It consists in an effusion of fluid into the serous cavities (arachnoid and ventricles) of the brain, not preceded by tuberculous deposit or acute inflammation, but apparently depending on chronic inflammatory changes affecting the membranes, and is to be regarded as a kind of dropsy. The disease is frequently congenital, and its presence in the fetus is apt to be a source of difficulty in parturition. It is, however, more commonly developed in the course of the first six months of life; but it occasionally arises in older children, or even in adults, as in the well known instance of Dean Swift, who died from this disease.

Symptoms.—Chronic hydrocephalus affects mostly children who bear evidence of a scrofulous, rickety, or otherwise delicate constitution. The chief symptoms observed are the gradual increase in size of the upper part of the head, out of all proportion to the face or the rest of the body. Occurring at an age when as yet the separate bones constituting the skull have not become welded, this enlargement may go on to a very considerable extent in all directions, but chiefly in the transverse and antero-posterior diameters, the membranous spaces between the bones becoming more and more expanded, though ultimately, should the child survive, ossification takes place, and the huge head becomes incased in a thin skull. In a well marked case the de-

formity is very striking. The upper part of the forehead projects abnormally, and the orbital plates of the frontal bone, being inclined forward, give a downward direction to the eyes, which have also peculiar rolling movements. The face is small, and this, with the enlarged head, gives a remarkable aged expression to the child. There is generally defective development in other respects, the body being ill nourished, the bones thin, the hair scanty and fine, and the teeth carious or absent.

Treatment.—Various methods of treatment have been employed in this disease, but the results are seldom satisfactory. Compression of the head by bandages, and the administration of mercury with the view of promoting absorption of the fluid, are now little resorted to. Tapping the fluid from time to time through one of the spaces between the bones, drawing off a little, and thereafter employing gentle pressure, has been tried, but seldom with permanent benefit. Attempts have also been made by surgeons to establish a communication between the distended ventricles within the brain and the subarachnoid space surrounding it; but though great temporary benefit has occasionally been obtained by such an operation, it has not been found to produce a permanent result. On the whole, the plan of treatment which aims at maintaining the patient's nutrition by appropriate food and tonics is the most successful, provided it be resorted to in time to admit of the arrest of the progress of the symptoms.

While there is little that can be done in the way of administering medicine for the cure of this disease, still the following have all been used with beneficial effect:

℞ Iodide of Potassium one dram
Lanolin two ounces
Mix.
Directions: Rub into the scalp every evening.

At the same time, give internally the following:

℞ Tartar Emetic three grains
Pulverized Squill three drams
Sulphate of Potash six drams
Cream of Tartar three ounces
Mix.
Dose: For a child six years old one teaspoonful three to five times a day.

When the child is drowsy, the feet cold, and the head hot, and he sleeps with the eyes half open, the pouring of a small steady stream of ice-water over the head until the patient is fully awake or falls into a normal sleep, is a good treatment. At the same time, keep the bowels well open.

POSTERIOR-BASILAR MENINGITIS

Definition.—This form of meningitis, which makes the rear base of the brain its favorite seat of attack, is encountered in children chiefly between the ages of six months and two years. It is an infantile type of cerebrospinal meningitis, as is obvious by the presence of the identical germs in the two affections.

Causes.—It is generally assumed that, in many instances, the specific germ which is responsible for this disease gains an entrance through the nasal passages, either directly through the base of the skull, or the Eustachian tube and middle ear.

Symptoms.—The principal symptoms are drawing back of the head, vomiting, fever, and convulsions; and although the malady is likely to run a rather protracted course, frequently covering a period of several months, recovery very often follows. Many of the cases which survive an attack are, however, crippled by mental weakness or hydrocephalus, which is an abnormal accumulation of fluid in the cranium, or some form of paralysis.

Just as soon as the disease appears, cleansing of the nostrils must receive marked attention, as well as the space back of the nostrils. The nostrils should be cleansed morning and night with a lotion composed of two grains each of borax and bicarbonate of soda to one ounce of warm water. The ears should be examined, and an incision freely made if the membrane is bulging. It should then be irrigated or drained twice a day by a physician.

It sometimes occurs that after the tension in the middle ear has been relieved, very satisfactory results follow, and this takes place in conditions described as being due to basilar meningitis, or inflammation of the membranes of the lower surface of the brain. It must be borne in mind, however, that the outstanding symptoms of basilar meningitis, such as vomiting, drawing back of the head, and fever, may be entirely due to pressure of fluid in the middle ear, and the rapid disappearance of all the symp-

toms after tapping excites suspicion that the disease did not really extend to the membranes of the brain or spinal cord.

Treatment.—During the course of the illness a discharge of pus from the nostrils very often develops and the inflammation extends to the eyes. It is, therefore, evident that the early treatment of the nostrils, to maintain them in a clean and healthy condition, is of the highest preventive value, in so far as averting this inflammation is concerned.

If any sores appear about the face or at the back of the head, they must be kept perfectly clean, and should be covered with an ointment consisting of one part of ammoniated mercury with six of pure white vaseline. It is important that the child be kept at rest in bed, washed twice a day in warm water, and any parts that have been exposed to pressure or friction (resulting from stiffness caused by continuous contraction, which is very often present) should be wrapped in absorbent cotton. The bowels must be carefully regulated and the patient given one grain of gray powder (mercury with chalk) with four grains of bicarbonate of soda, twice a day, for a few weeks.

The child should be fed on plain but nourishing food with regularity. One of the marked features of this malady is wasting, and this must, as far as possible, be counteracted by the amplest diet, without any disturbance to the digestion. While there is fever, the diet ought naturally to consist of milk and barley-water. Cream, cod-liver oil, or simple puddings may be added afterward, if the age of the child should permit. If there is difficulty in swallowing and consequently insufficient food taken, the child may be fed regularly with the stomach-tube. This disease does not yield to direct treatment with drugs, but bromide may be given for restlessness, sleeplessness, or convulsions.

CEREBRAL PALSIES

In infancy and during childhood the cerebrum is subject to many affections, acute and chronic, such as encephalitis, abscesses, etc. Many cerebral affections leave behind a condition of paralysis which affects one or both sides of the body. In cases of this kind it is essential that due attention be paid to the paralysis, and that an effort be made to improve and maintain power in the limb or limbs.

If only one limb is affected, there will be a tendency in the child to allow that limb to fall into a state of disuse and to employ only the good one. This tendency must be counteracted by tying up either the unaffected arm or limb, as the case may be, for some hours every day, and by encouraging the use of the affected limb. In the case of an affected leg, the child should be made to practise movements and to walk as much as possible. The tendency not to use the affected leg or arm must be counteracted by massage and movement of the joints in the affected limb once or twice a day. If found necessary, a splint should be applied to the paralyzed limb at night, so adjusted as to counteract the tendency to contraction. It frequently happens, however, that in spite of regular massage, passive and active movements, the deformities will become fixed and permanent. In order to afford relief, the operation of tenotomy, which is the cutting of a tendon, will have to be resorted to.

As regards the mental condition of the child, amentia or imbecility is frequently associated with cerebral paralysis to such a degree as to render an operation utterly useless. If there is only a certain amount of backwardness, and proper training to use the affected limb at all possible, an operation may result in substantial benefit to the child and be a source of joy to those interested in its welfare.

Treatment.—If the treatment of cerebral paralysis is undertaken and pursued steadily during the early stages of the affection, incidental to proper food, fresh air, and faithful nursing, then those afflicted with the disease will derive material benefit. Unfortunately, however, these essential and truly vital requisites are, in a large number of cases, lamentably lacking, and the distressing result is the pathetic spectacle of cripples innumerable.

The most important item in treatment is the prevention of spastic contraction. Even when contraction has become so marked that the hand is almost useless, great improvement can be obtained from long-continued perseverance in passive movements. There is no doubt that some of the most troublesome deformities produced by the spasticity of cerebral palsy might be prevented, or at any rate minimized, by the use of passive movements in the early stages of the affection. There is no need for massage in these cases; indeed, it hardly seems logical to apply

massage to muscles which are already doing more than is desired, and it is not likely that any massage applied to those muscles which are being overcome by the stronger ones in these cerebral palsies can so stimulate them as to counterbalance the tendency to spastic contraction. On the other hand, passive movements regularly and frequently applied so as to overcome by force the spastic deformity, are, as experience shows, of decided value; they are most applicable to the forearm and hand, where slow pressure directed to abducting the thumb and extending the fingers, wrist, and elbow, will overcome the usual deformities.

These passive movements, each done slowly several times in succession, should be repeated three or four times daily, and if there is already considerable contracture, which from neglect has become continuous, it may be necessary for a few weeks to wear a splint in the intervals between the passive movements, so arranged as to prevent the deformities.

With such measures, decided improvement will soon be noticed, but it is only by patient perseverance that the deformity can be prevented from recurring; and this entails considerable patience on the part of the parents until the child is old enough to realize the importance of the movements and to do them for himself with the sound hand. At the same time, it is important to make the child use the affected arm and hand as much as possible, and toys and games should be selected with this object in view. The lower limbs are to be treated on similar lines, and by simple dancing and drilling, in the milder cases, the gait may be improved.

Drugs have little place in the treatment of the cerebral palsies; considerable improvement is, however, obtained in some cases by operative measures.

TUBERCULOUS MENINGITIS—ACUTE HYDROCEPHALUS

Tuberculous meningitis, or tuberculosis of the brain substance, a disease to which children are peculiarly liable, is usually secondary to some tuberculous lesion or injury to the body, and is almost invariably fatal.

No specific medical treatment is known for this disease, and though surgical operations have been repeatedly tried, they have

proved utterly valueless. A peculiar feature of this affection is that it frequently attacks children who present every appearance of being in perfect health and in whom no previous symptoms of tuberculosis were apparent.

After an attack, the only thing possible to do is to keep the patient very quiet and comfortable. Symptoms of headache, restlessness, and convulsions must be relieved by the application of cold to the head, as well as by phenacetine and bromides. The diet should, of course, be simple, and during the final stage of the disease, when the child finds it impossible to swallow, which is characteristic of that period, it is not at all advisable to attempt to force the child to take nourishment. Stimulating substances of any kind should not be given, as adopting such means for the purpose of prolonging life will be of no possible avail and is utterly ineffectual.

NEURASTHENIA

Definition.—This is of very common occurrence in children between the ages of nine and fourteen, and is a condition which very closely resembles neurasthenia in adults. There is also in such cases a history, usually of nervous disturbances in the parents.

Causes.—It frequently happens that the strain of life at school develops the more active causes of neurasthenia, for these victims are invariably subject to mental overwork, and the result of this extreme strain on the nervous system is a nervous collapse or breakdown.

Symptoms.—The child complains of tiredness, becomes dull and listless, apathetic, is unable to keep his attention fixed while at school, is unable to remember his lessons, and the ultimate result is a thorough upsetting. He has crying-fits as a common feature, and there is perceptible loss of control of the centers of emotion. There is a fixed and permanent expression of worry and fatigue, and a physical examination will generally confirm the evidence of the existence of the general atonic condition existing, that is to say, a condition marked by a lowering of tone and vigor. The heart-sounds are weak, the pulse is exceedingly small and feeble, and the extremities are usually cold and blue. Fainting-attacks, palpitation, and excessively rapid action of

the heart are all brought on. Albuminuria is often present, and is of the variety in which the albumin appears only after the patient has been walking about, and it is not accompanied by any signs of organic disease. The stomach and bowels are without tone and vigor, and constipation is usually a feature more or less marked.

The patient frequently complains of headaches, backaches, and other pains whose origin is uncertain, and added to the chronic condition are nerve-storms which occur occasionally in the form of prostrating illness and headache, a mild form of delirium and sleeplessness.

Treatment.—There are many difficulties encountered in the treatment of such cases. It is not advisable to give iron and arsenic until the appetite is in a healthy condition, and it is likely that they will not be needed then. It is not safe to reach the conclusion that inflammation of the kidneys exists merely because albumin is present. It is not reasonable to encourage the belief that the patient can be possibly cured within a brief period of time, with a dose or two of some medicine. Such cases must be treated as nervous breakdowns and the improvement can be but slow. It is absolutely essential to remove all exciting causes of the disturbance, and school lessons are among them; indeed, they are chief among them. It is advisable to suspend all school work for a period of about three or six months, or as long as the condition continues. It is highly beneficial to send the child away into the country where he will not be associated with other children, when the home life of a family of boys and girls is too great a strain and too trying for the overstrung nervous system. All the excitements of child life must be eliminated and forbidden.

In severe cases of prostration, the very best results will be obtained from rest, separation or isolation, proper feeding, and massage. A very essential point in the treatment is to make it possible for the patient to secure proper and adequate sleep, which in the case of many of these sufferers is very often much disturbed and broken. Two hours during the day should be given to rest and sleep, and not less than ten hours during the night. The diet should be very carefully regulated, avoiding all stimulants such as tea, coffee, and alcohol, as they are more or less likely to do considerable harm. The patient should be put

on a proper mixed diet of meat, fish, eggs, and vegetables. Puddings, spices, and highly seasoned foods and rich sauces must be strictly avoided, and very substantial benefit will be derived from taking one or two pints of milk every day; but the amount of the diet must be regulated according to the condition of the patient.

If there is constipation, it must be relieved by means of cascara, senna, or castor-oil, and as the underlying troublesome condition is lack of tone and vigor of the bowels, very great benefit will be derived from a course of abdominal massage. In acute attacks of pain in the abdomen, local soothing applications, rest, and low diet are all that is necessary, but these attacks are usually of brief duration. When the headaches are severe, doses of from three to four grains of antipyrine or phenacetine will be of considerable value, but care should be taken not to prolong their use unduly, as such nerve sedatives will be very injurious to the system, which is already considerably weakened. The condition of the heart and the albuminuria do not necessarily require special treatment, as both are due to the vasomotor instability or unstable motion in the vessels present in this affection.

The following will usually be sufficient to meet the principal indications:

℞ Tincture of Nux Vomica two teaspoonfuls
Bromide of Sodium two teaspoonfuls
Fluidextract of Cascara Sagrada four teaspoonfuls
Water, enough to make three ounces
Mix.
Dose: One teaspoonful each night in a wineglass of water.

FRIEDREICH'S ATAXIA

This is a disease resembling locomotor ataxia, and due, like the latter, to sclerosis or hardening in certain areas of the spinal cord and brain. It occurs usually in children. Its chief symptoms are unsteadiness of gait, with loss of the knee jerks, tremors of the hands, head, and eyes, deformity of the feet, and curvature of the spine. The progress of the disease is very slow, and is uninfluenced by any treatment.

EXERCISE AND MASSAGE FOR CHILDREN

INTRODUCTION

BABIES should be given exercise each morning after the bath. This acts as a general tonic and stimulates the flow of blood. The exercise should not be violent, and if the child shows signs of weakness the treatment should be stopped, or a milder form substituted.

It may not appear to the mother to be worth the time she spends in exercising the child; but the results after a month's time will show that the child has a better resistance to colds and fevers. There are many forms of exercise suitable for children, but the following pictures show the best methods. Mothers may begin to give the child exercise and massage as early as the fifth month.

EXERCISES I AND II

These exercises consist in extending the hands from the sides up over the head. This should be done slowly. Gently take the child's hands and pull them up over the head, keeping the elbows straight. The child should not be forced to do this, as the resistance offered by the child takes away the good results. This form of exercise is very valuable for expansion of the chest and development of the chest muscles and also of the muscles attached to the upper part of the arm and shoulder.

EXERCISE III

The exercise shown in this picture will be found to be good for the development of the hip-bones and the muscles attached to the upper part of the leg. The mother's hand is placed about the knee and the legs gently drawn up on the abdomen. Next

the legs are pulled apart for a short distance. This exercise is also beneficial to strengthen the muscles of the abdomen.

EXERCISE IV

This form of exercise is valuable for the development of the muscles of the arm and shoulder. The child is taken at the sides of the abdomen and supported so as to stand on his hands. The child will tire easily of this exercise, but the mother must give support to the middle part of the body and the legs. In this, the wrist is also strengthened by supporting the weight of the body.

EXERCISE V

This picture shows massage of the chest, which is recommended for young children. The hand is placed at the side of the chest and drawn over the chest; then the hand is allowed to slide back to the side. The hand of the mother must be warmed so as not to chill the body. The pressure should be made evenly and the massage made with a single, continuous stroke.

EXERCISE VI

This form of exercise is not advised for very young children. It is valuable for children who show a tendency to round shoulders or who have weak muscles over the back of the neck and over the shoulder-blade. The child's hands are extended outward and then gently drawn back. This should be done slowly and with very little force. It is a valuable form of exercise for building up the shoulder muscles, especially those that support the head.

EXERCISE VII

In some children the soles of the feet become rather scaly because of the poor circulation in that part. A simple remedy is massage of the feet, as shown in the picture. Gently take both ankles and with the soles upward massage the whole area, the hand drawn back rather forcefully and allowed to slide forward again. This form of massage is valuable to keep the feet warm without wearing extra-heavy stockings.



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EXERCISE I



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EXERCISE II



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EXERCISE III



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EXERCISE IV



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EXERCISE V



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EXERCISE VI



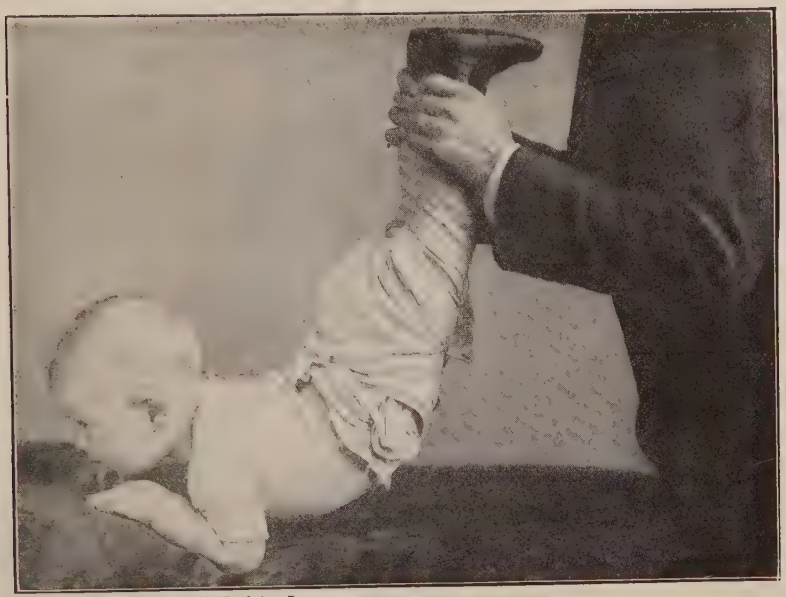
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EXERCISE VII



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EXERCISE VIII



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EXERCISE IX



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EXERCISE X



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EXERCISE XI



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EXERCISE XII



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EXERCISE XIII



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EXERCISE XIV



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EXERCISE XV



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EXERCISE XVI

EXERCISE VIII

The method of massage shown in this picture is confined to the sides of the chest and abdomen. This form consists in drawing the hands along the side with pressure on the up stroke. It is a valuable form to develop the muscles of breathing, and in many cases proves valuable for relief of distention.

EXERCISE IX

The child will find great delight in this form of exercise. It is not recommended for young infants. This exercise should not be performed immediately after feeding, as the inverting of the body is liable to cause vomiting. The child's ankles are grasped and the whole body lifted up. The child then supports itself on its hands or elbows. It is a valuable exercise for the shoulder muscles and those on the front of the abdomen.

As shown in the picture, the muscles of the abdomen are stretched, and this has a tendency to relieve the bowels of gas and relieve constipation.

EXERCISE X

The exercise shown in the picture is good to strengthen the shoulder. It is not recommended for young children. It strengthens the shoulder against bruises when the child falls. First, the child lies flat on its back; then the hands are taken and the body raised up and forward. The hips of the child should not be lifted off the table, because that would put all the weight on the arms. This form of exercise is valuable for developing the muscles of the back and strengthening the spine.

EXERCISE XI

In this form of massage the front of the chest is developed and the pectoral muscles strengthened. One hand of the mother is drawn from side to side, the whole length of the chest. In children suffering from chronic colds, this form of massage will give them some resistance against exposure to drafts.

EXERCISE XII

This picture shows a form of massage which is especially valuable for children suffering from distention of the abdomen with gas. The mother takes the child by the lower edge of the ribs and lifts the body up, then carefully allows the child to rest on its abdomen. In this exercise the lower ribs are used, which ordinarily remain lax.

EXERCISE XIII

The massage of the legs as shown in the picture is recommended for all children. It makes the muscles of the legs stronger and aids the beginning of walking. The hand is forcefully pushed toward the hip with a rotating movement. No pressure is made when the hand is drawn back toward the ankle. This exercise keeps the legs normal in shape and aids in the prevention of large ankles. It is also an aid in restoring the muscles of the legs to their normal tone, after a severe illness, such as infantile paralysis, etc.

EXERCISE XIV

This picture shows massage of the back part of the chest, which is recommended for the muscles of breathing. In this form the child's hands are placed under the chest and the mother gently rubs from side to side. Weakness of the spine is sometimes found at this area and this form of massage will aid in preventing it.

EXERCISE XV

Massage of the abdomen has been found especially valuable for children with chronic constipation. By regulating the diet and instituting this form of massage, most cases can be cured. In this, the whole abdomen is gently pressed under the tips of the fingers. It is practically called kneading the stomach. If there is a large amount of gas present, extra pressure may be made along the left side.

HOME NURSING

INTRODUCTION

THE following article is intended for those who wish to nurse their sick relatives and friends in their own homes. It gives a general outline of sick-room methods, and explains, as simply as possible, the easiest and best way of applying certain remedies and of nursing particular diseases.

THE INVALID'S ROOM

An invalid's room should be as large and sunny as possible, facing either south or southeast.

Sunshine has a wonderful effect on the nervous system, and to be able to see from his window the dawn of a new day, will often bring hope and courage to a patient after a weary night. A large window area is desirable, with dark curtains or blinds to exclude the light when necessary; but if the patient's condition permits, it is well to let the sunshine into his room, as it purifies and acts as a powerful disinfectant.

The room should be within easy reach of a hot and cold water supply, and in the quietest part of the house where the invalid will not be disturbed by the noises of the road or by the passing to and fro of the inmates of the house.

It may be necessary, in the case of a long illness, to convert a sitting-room into the sick-room. So much depends upon the patient's surroundings that the choice of a room, its position in the house, and all arrangements for the patient's comfort and happiness will repay any amount of trouble.

Ventilation.—The atmosphere of the sick-room is of primary importance, fresh air being as necessary as food. Impure air must be let out and a fresh supply of pure air constantly admitted. At the same time, drafts must be avoided. The windows

should be always opened from the top, and in warm, sunny weather they may be opened from below as well. There are cases where even in cold, wintry weather it is better for the patient to have the windows open night and day, but the patient's condition and the nature of the disease must be taken into consideration.

It is never sufficient to air the room by opening the windows once or twice a day and keeping them shut between. Fresh air must be continually coming in and taking the place of the vitiated air.

A light, portable screen covered with washable material, placed between the door and bed, will be a great protection to the patient and will help to ventilate the room by distributing the current of air, which tends to move in a direct line between the door and window or chimney. In very exceptional cases, where it is impossible to have the window open all the time, the patient should be well covered up in bed, with a light wrap over the head as well, while the windows and doors are set wide open for several minutes; this may be done several times a day and once in the night and early morning

The best and most hygienic way of warming a sick-room is by an ordinary coal fire. A fire is one of the chief factors in causing free movement of the air, so that it is advisable to have a small fire burning in the grate always, even in the summer time, and only when it is oppressively hot should it be dispensed with. A thermometer should be placed near the patient's bed and the room kept at the same even temperature all the time.

As a rule, the temperature of the sick-room should be about 60° F. or higher, but a good deal depends upon the nature of the case.

It is important to look at the thermometer at regular intervals during the day and night.

In cases of severe illness, the patient's vitality is usually very low between 1 A.M. and 4 A.M., so that collapse must be guarded against by keeping up the temperature of the room, refilling hot-water bottles, and giving a warm, stimulating drink, such as tea or coffee and milk. Any other stimulant should be given only by the doctor's orders.

A pure current of air must be allowed to have free access by the window; in large towns, the night air is often purer than

the day and the patient must not be deprived of its beneficial effects.

Choice of Bed and Bedclothing.—A long, single iron bed is the best for a patient. A double bed is heavy to move and difficult to arrange, although it has one advantage in giving the patient a cool, fresh side to be lifted on to, which might often be a greater comfort.

The spring mattress and chain beds now in use are better in every way than the old-fashioned spring mattress. A good hair mattress is better than a cotton, although a good cotton is quite comfortable and suitable.

A single blanket, large enough to tuck in at the top, should be placed over the mattress and the under sheet should be large enough to tuck in all around. Bolsters are not often used now; most people prefer single pillows. These should be arranged as the patient likes; usually a firm one underneath and a nice soft one for the head.

There should always be a good supply of pillows, as often a change of position by putting a cool, fresh one to the head will be refreshing and may even induce sleep.

In nursing helpless patients and children it will be necessary to have a rubber sheet on the bed to protect the mattress. This should be long enough to stretch across the bed and tuck in at the sides, and should be placed over the under sheet with a draw-sheet to cover it. Old sheets can be used as draw-sheets, folded down the middle and stretched across the bed with the folded edge next the top of the bed. The surplus length of sheet should be rolled into a neat roll and tucked under one side of mattress.

The blankets should be light, warm, and all wool, and they should be large enough to tuck in at either side.

A pretty light cover should complete the bedclothing.

Position of the Bed and Furniture of the Room.—When the bed is a light, narrow one, wonderful variety can be given the patient by changing its position in the room; but during the acute stages of the illness the bed must be placed so as to insure quiet and comfort for the patient. It should not be placed against the wall, the nursing being so much easier if the patient can be reached from either side of the bed.

All heavy curtains and drapery should be avoided, and rugs which can be taken up and shaken are preferable to carpets. At

the same time, the room must never be rendered more bare and comfortless than the needs of the case demand.

If there is a dressing-room adjoining the sick-room, all the invalid requisites may be kept there; but if not, the washstand and table with medicines, dressings, etc., must be conveniently placed, yet so that neither the patient nor any visitor coming into the room will be aware of their existence.

Basket or wicker chairs should not be used, as the constant creaking sound is very objectionable. There should be three or four light easy chairs, a comfortable couch, a chest of drawers for the patient's things, and one or two tables. The wall-paper or coloring should be rather light—green is perhaps the most universally soothing color, and red should be avoided. The curtains and furniture should be in harmony with the walls and woodwork of the room.

A few good pictures will be of great help in providing the patient with interest. During a long illness the pictures might be changed from time to time, to make a variety.

Flowers will almost always give much pleasure, as well as adding greatly to the beauty of the room. They should never be allowed to remain in the room when they have begun to fade, and all strongly scented flowers should be avoided, or only allowed to remain in the room for a short time. Flowers and plants should all be taken out of the room at night.

Care of the Room.—If the room has no carpet, only rugs, as suggested, they should be taken up and shaken daily and the floor rubbed over with a floor-cloth and the woodwork carefully dusted. This should be done, if possible, after the patient's bed has been made and the toilet completed. After the dusting, the flowers and pictures should be arranged so that the room is in perfect order and the patient quite ready for the doctor's first visit. The arrangement of the room should be a matter of great care and thought. If the patient expresses any ideas about it, they should, as far as possible, be carried out.

Often much annoyance may be avoided by planning the early morning hours so as to get everything in order before the doctor comes.

The sick-room, therefore, should not only be bright and comfortable in appearance, but it should be a place where time and order are strictly adhered to.

INVALID REQUISITES

Feeding-cup.—If the patient is helpless and obliged to lie flat on his back, a feeding-cup will be necessary. The old-fashioned cup with a spout like a teapot has been condemned because of the difficulty of keeping the inside of the spout absolutely clean. The best is one without a spout, and may be had both in china and glass. It is well to have one of each—a china one for tea, coffee, or soup, and a glass one for milk, lemonade, or soda-water.

Clinical Thermometer.—A good clinical thermometer should be kept in every family medicine cupboard. Always disinfect carefully in carbolic solution, 1 to 40, both before and after use.

Medicine Glass.—Medicines should always be measured in a measure glass, and drops in a minim measure. A larger measure is used for lotions, and an earthenware jug-shaped measure is useful in measuring milk or other fluid drinks.

Rubber Sheets.—Rubber sheets for beds should be waterproof on both sides. They may be bought either by the yard or in sheets large enough to cover a whole mattress.

All rubber sheets should be scrubbed once a week. In order to do this thoroughly, lay the rubber sheet out on a table and with a brush and soft soap and water scrub first one side and then the other. Remove the soap with a flannel and plain warm water and hang up to dry.

Any stains on the rubber sheet can be removed with a little Sapolio. If it is an infectious case, the rubber sheet should be washed over with 1 to 20 carbolic solution.

Water-beds.—These may be had in several sizes, and are very useful in cases of paralysis or where the patient is very thin. The most useful size is 36x24 inches.

Air-cushions.—These may be had in almost any variety of shape and size, and are often a great comfort to the patient. Perhaps the most useful is the circular air-cushion; this is filled with as much or as little air as will make it comfortable under the patient's back. When not in use an air-cushion should never be emptied and folded up, but a little air should be left in and it should be laid away flat.

Bed-pans.—There are two kinds of bed-pan—the round one, which is most suitable for children, and the slipper.

Spittoons.—Cups for expectoration should be china with a lid; but if the patient is up and able to get about, a spitting flask will be more useful. Needless to say, these utensils must be kept scrupulously clean. About a teaspoonful of strong carbolic solution (1 to 10) should be kept in the cup and flask always. In the lavatory or near the sink where these articles are washed there should be a special brush for cleaning and towel for drying, and kept quite apart from any other towels or brushes which may be used.

There should always be two cups in use, so that when one is being cleaned the patient never has the discomfort of being left without one. The same applies to basins if the patient is sick. Put a clean one on the table near the bed when you remove the one that has been used. To keep the invalid utensils clean and properly disinfected is a most important part of the nursing work, and ought not to be left entirely to servants.

A jar should be kept in the lavatory with some strong-smelling disinfectant, such as carbolic acid solution. A small mop should be kept in this jar for cleansing the bed-pan after use; and a special towel with a loop on it should be hanging near and kept for wiping the bed-pan only. After scalding and drying the bed-pan put a very little disinfectant in it, and keep it in a convenient but not conspicuous place in the sick-room, covered with a clean towel as well as the lid.

All excretions should be removed from the patient's room at once. A little cold water poured over the motion is better than anything for counteracting the smell.

Urine should be removed from the room, and not allowed to remain without a cover. The gases which rise from it are of a poisonous nature, and vitiate the air more than people think.

CARE OF THE INVALID

We hear of people being "born nurses," but this is not the case. True, some have much more aptitude for nursing than others, but, as in all other professions, natural gifts must be cultivated.

For home nursing, the ideal mother or sister would be best qualified to undertake the care of the invalid—the one in the

home to whom all naturally turn for the satisfaction of their most intimate personal needs, because she has an understanding mind, a delicate and ready tact, with a power of apprehending and supplying wants.

She will have the advantage of the professional nurse to begin with in being intimate with the character and temperament of her patient. Much unnecessary suffering may be avoided by this knowledge. She will realize the necessity of considering the temperament of her patient and modifying the treatment accordingly.

In all cases guard against noise and fuss. Move about quietly and lightly. Lift things firmly but quietly. Speak in a quiet voice, but never in a whisper, as that is very irritating to a patient. Do all that has to be done quickly and thoroughly. Be punctual with all meals, giving of medicine, and applying treatment. Be faithful in fulfilling every promise made to the patient, and regard all that passes in the sick-room as sacred, not to be repeated on any account, or talked over with others.

Always inspire the patient with confidence in his doctor. Never question his treatment or doubt the wisdom of his methods, but carry out faithfully all his instructions, and let the patient see and feel that both his nurse and doctor are working together for his good. This coöperation will inspire him with confidence, so that he will respond more readily to the prescribed treatment.

Observations.—Accuracy is one of the first absolutely necessary lessons to be learned by those in charge of the sick—accuracy in observation, in the description of what is observed, and in carrying out orders in every detail.

There are several details about a patient's condition which a careful nurse habitually notices and reports upon. These are: the general appearance and condition—pale or flushed, listless or restless, or if there is a drawn, pained expression; the condition of the skin—moist and clammy, or hot and dry; the color of the lips and the appearance of the tongue; appetite; sleep—notice the character of the sleep as well as the duration, if it be restless and uneasy, light and fitful, or dead, heavy sleep with loud breathing. All excretions should be carefully observed.

Notice also *urine*—the quantity and frequency, and if any discomfort or difficulty in passing it; evacuation of the bowels—the

frequency and appearance of the evacuation—if any hemorrhage, whether it be dark colored and mixed with the excreta or bright red in clots; vomit—if the patient is sick, notice what the vomited matter is like, and if there is blood, if it be bright red or dark in color; cough—notice if the patient's cough is constant, deep or shallow, wheezy or hard and painful; if there is any expectoration, the character of it and if there is much pain and exhaustion; position—always observe the patient's position in bed, particularly when asleep: it is one of the best ways of learning how to make him most comfortable. Notice if he sleeps better on one side than on the other, if he coughs less on one side than the other, and if he is less sick; if in pain, notice if he is relieved by change of position.

Effect of Remedies.—When the doctor has ordered a certain remedy, he will expect the nurse to notice and report on its effect. For instance, if a sleeping-draft has been ordered, notice and report the exact amount of sleep, how long the draft took to take effect, and if the patient seemed refreshed after it, or woke up with a headache and feeling sick; or if a drug has been ordered to stop vomiting, notice if the intervals between the attacks of vomiting are lengthened and if the pain and discomfort are less.

Certain drugs have certain definite effects, and these must be noted with care. A notebook should be kept, with the written reports clearly and distinctly recorded—the night report on one page, and the morning report on the opposite side. Rule the page into as many columns as are necessary, perhaps four or five, and record:

Sleep.—Amount and kind.

Food.—Quantity and kind; hours it was given.

Medicine, stimulants, etc.

Applications.—When changed, and appearance of swelling or wound, if any.

A chart with the temperature, pulse, and respiration records must be carefully kept.

Pulse.—To take a patient's pulse properly, use a watch with a seconds hand. Place the tips of three fingers over the radial artery at the wrist and count the number of beats to a minute. A quicker way is to count the beats during twenty seconds and multiply the result by three; or count them for thirty

seconds and multiply by two. At the same time notice the quality of the pulse, if it be full and bounding, rapid and thin, or feeble and soft. Following is the average number of beats per minute:

One year and under	115 to 140
Between one and two years	100 to 115
Between two and eight years	90 to 100
Between eight and twenty years	75 to 90
Between twenty-one and seventy years	65 to 75
In elderly persons	70 to 85

Respirations.—Count the respirations without the patient's knowledge by placing the arm across the body below the chest when taking the pulse rate. When you have taken the pulse, keep your fingers on the wrist a little longer and count the rise and fall of the chest in respiration. Notice if the breathing is short and shallow, or deep and labored. When there is any great difficulty in breathing, care must be taken to alter the patient's position. As a rule, when breathing is difficult the patient is much more comfortable sitting up. He should be well propped up by pillows or a bed-rest.

Temperature.—To take the patient's temperature, use a good clinical thermometer, ranging from 94° to 110°. The degrees are marked on the glass by long lines. In between these are four short lines dividing them into five points. The normal temperature, being 98.4°, is usually marked on the thermometer by an arrow or thick black or red line.

Before taking a temperature, shake the mercury down to its lowest point and disinfect it by dipping it into a solution of carbolic or lysol before inserting it under the patient's tongue. See that the lips are closed over it and keep it in position for one, three, or five minutes, according to the thermometer.

For children, old people, and unconscious patients, it is best to take the temperature by placing the thermometer under the arm or in the groin. If under the arm, it should be kept in position by folding the arm across the chest. The more exact method is to insert the thermometer for about one inch into the rectum and leave it there for about five minutes. It may also be placed under the tongue with the lips tightly closed; the latter method is, however, dangerous in young children, as they are likely to bite on the frail instrument, breaking it and swallowing the pieces. A child should never be left with a thermometer or be

held responsible for it. Be careful to disinfect the thermometer before putting it back in its case.

Note.—The temperature should never be taken after the patient has had a hot drink, and should be taken before he is bathed. If cold or tepid sponging is ordered to bring down the temperature, it ought to be taken before and after the sponging.

Making the Bed.—There is a great art in making and keeping a patient's bed healthy, comfortable, and tidy. The bedclothes must be aired daily and the linen changed regularly. If the patient is quite confined to bed and likely to be ill some weeks or months, it is very necessary to have two sets of blankets and rubber sheets, one for day and one for night use; otherwise it is impossible to get the blankets thoroughly aired. If the patient is able to get up or be moved on to a couch, the making of the bed will be comparatively easy. The bedclothes should be taken off one by one and hung over a chair, and the mattress turned from top to bottom, every day. If a rubber sheet is required, it should be put over the under blanket or just under the draw-sheet if there is one.

When the patient is too ill or helpless to be taken out of bed and the under linen has to be changed, it is necessary to make very careful preparations beforehand. It is much easier for the patient when two people make the bed instead of one; it saves much unnecessary turning and passing from side to side. Have ready two clean sheets and a draw-sheet well aired and warm, a night-dress (there should always be two in use, one for the night and one for the day), warm water, soap, towels, and alcohol and powder. If the patient is likely to feel cold, a hot-water bottle should be put to his feet.

Remove the top cover, one blanket, and top sheet, leaving the patient with at least one blanket to cover him. Untuck the under bedclothes all round and turn the patient gently over on to his side, roll the under sheet, rubber sheet, and draw-sheet close up to the patient's back, and place the clean under sheet, rolled to half its width, alongside, and the clean draw-sheet rolled to about half its length by its side. It will save much time and moving if there are two rubber sheets, one to replace the other, when the draw-sheet is changed, otherwise the rubber sheet taken out will have to be washed over, dried, and put in again.

When the patient is on his side, it is a good plan to take the

opportunity of bathing his back and hips, and rubbing with alcohol and dusting with powder. When this has been done, draw the night-dress down very smoothly, and see that there are no wrinkles under him; then turn him over on to his other side, remove the soiled sheets, and unroll the clean ones, tucking them smoothly and tightly under the mattress all around. Put the clean top sheet on over the blanket which is covering the patient, and a blanket over it, so that when you draw the blanket which is covering him away he will not be left with only a sheet. Then finish making his bed as quickly as possible. Remove all soiled linen from the room, and never air sheets or towels in the sick-room.

In some cases a patient cannot be turned from side to side to have his bed made; then the under sheet must be put in from the top of the bed. Roll the clean sheet along its width to within a yard of the top, untuck the soiled sheet all around, get someone to raise the patient's head and pillow while you roll down the soiled sheet under them, and tuck the clean sheet in at the top of the bed. Then the head may be laid down while the shoulders are raised and both sheets rolled down under them. Next the lower part of the body is raised, and the sheets passed under it, so that by degrees the soiled sheet can be removed, and the clean one unrolled and tucked in all around. If the patient is not too ill he will probably be able to lift himself up so as to have the draw-sheet put in under him; but if he cannot do this, the clean draw-sheet should be pinned with safety-pins to the soiled draw-sheet, and then the nurse should gently raise the lower part of the patient's body while the assistant pulls the draw-sheet through, leaving the clean one under the patient. Great care must be taken to see that the draw-sheet is kept quite smooth under the patient.

It is not enough to make the bed night and morning; it must be attended to many times a day, and the invalid kept comfortable, sheets smoothed, and pillows rearranged whenever it seems necessary.

An injured limb should always be supported on a pillow. If the patient has pain in the abdomen and keeps his knees drawn up, a long pillow stretched across the bed under his knees will be a great relief.

In some illnesses, such as rheumatism and nephritis, the pa-

tient will be ordered to be kept between blankets. In this case very soft, light, smooth blankets should be used. A large shawl is better than anything as a covering in a case of rheumatism; it is so beautifully soft and warm and yet so light. Put a sheet on the top of the shawl or blanket which covers the patient, and make it come higher up, so that the woolen blanket does not come against the patient's face.

The blankets should never be doubled over on the patient's chest; they should come well up to his neck, and the extra length tucked in at the foot of the bed.

When the invalid is well enough to sit up and have his bed made, a comfortable chair should be placed near the bed, and a blanket spread out over it. He should have warm stockings and slippers on, and a blanket or large shawl wrapped around him as he gets out of bed. When he sits down the blanket on the chair should envelop him all round. In cold weather a hot-water bottle should be placed at his feet, and a screen put around the chair to protect his head and shoulders from any drafts.

In long illnesses, when the patient becomes very thin, it may be necessary to have a water-bed or cushion. One about 20x30 inches is a useful size. It should be rolled in under the patient the same way as the draw-sheet, and filled after it is in by means of a funnel. Warm water from 80° to 90° F. should be used, and it should be filled with just sufficient water to prevent any part of the body pressing on the under side of the cushion. If it is filled too full it becomes hard and uncomfortable. The draw-sheet should come over the water-cushion. If a full-sized water-bed is used, boards should be placed across the bedstead, under the mattress, to support its weight and keep it level.

The Toilet.—As a rule, it is advisable to give the daily bath at night; but if the fatigue of having the whole body sponged at one time is more than the patient is able to bear, then the upper part may be bathed in the morning and the lower part in the evening. Before commencing to bathe the patient see that the room is warm, and have hot-water bottles in the bed. Have a night-dress and towels warming by the fire, a jug of hot water and a jug of cold, sponge, flannel, or bath-glove, soap, powder, and alcohol.

Remove the top sheet and all the blankets but one. Put a towel around the patient's neck, and wash and dry the face and ears

first; then slip a large bath-towel over the patient under the blanket and remove the night-dress; wash the neck, hands, and arms, and dry them with another towel. The chest and lower part of the body must then be bathed under cover and dried carefully. To bathe the lower limbs put a large towel or bath-blanket underneath them to prevent wetting the bedclothes. As the feet are particularly sensitive to the touch it is best to put them one at a time into the basin to wash them. Dry carefully, but with a firm touch, as it is likely to irritate.

After washing the lower limbs, turn the patient on to his side and place a bath-towel alongside of his back. Wash the back of the neck and shoulders and dry, then the spine and hips. Rub all prominent parts, such as shoulder-blades, spine, lower part of the back, and hips with methylated spirits or eau de Cologne. This will harden the skin and prevent bed-sores. Powder with some fine soft powder such as powdered starch or talcum powder. The bathing over, put on the night-dress and quickly replace the top sheet, blankets, and cover.

In cases of acute rheumatism, nephritis, or pneumonia, long, loose flannel jackets fastening down the back, with wide sleeves tied with tape at the wrists, will be found much more convenient than the ordinary night-dress.

After the bath, remove all the wet towels to another room to be dried, and when they are dry they should be brought back to the patient's room, folded and hung on the towel-rail. Attention to details of this kind will add to the patient's comfort.

Care of the Teeth.—The teeth should be well brushed twice a day, and the mouth washed out with a little bicarbonate of soda in warm water, after each meal. Unless the patient is very ill or helpless, he will always prefer to brush his own teeth, but if he is too ill to do it for himself it must be done for him with a soft tooth-brush and good dentifrice. The patient's mouth frequently gets into a bad furred or coated condition, and must be cleaned several times a day. To do this thoroughly, put a little glycerine and lemon juice into a cup; take a thin strip of white absorbent cotton and twist it around a tooth-brush handle; dip it in the glycerine and swab the gums, tongue, and roof of the mouth, renewing the swab of cotton from time to time and placing the soiled pieces on a dressing-tray or saucer, to be burned afterward.

Nails.—Finger and toe nails should be kept scrupulously clean and trimmed regularly. For cleansing them, soap and water and a good nail-brush are the best things to use. The finger nails may be polished after washing, with chamois leather.

Hair.—The care of the hair is an important part of the patient's toilet. It should be brushed night and morning. A woman's hair should be parted down the middle and dressed in two braids, one on either side. When convalescence is well advanced, the hair should be washed in this manner: Prepare a shampoo powder in a jug of warm water; get the patient to lie pretty low down in the bed, to allow room for a basin to be put between the pillow and top of the bed; spread a rubber sheet and towel over the pillow and under the basin, and another towel around the patient's neck; put the hair into the basin and pour the shampoo mixture over it, rubbing it well into the scalp. Rinse well in warm water, emptying the basin from time to time, and dry with hot towels. A little bay rum will help it to dry more quickly.

To Prevent Bed-sores.—Any part of the body where there is any pressure is liable to become tender and sore. The most usual place for a bed-sore is the lower part of the back; but the careful nurse will guard against even the possibility of redness by using means to prevent it. All prominent parts, such as the spine, shoulder-blades, hips, heels, elbows, etc., should be bathed night and morning with a good lather of plain unscented soap, dried with a soft towel, and rubbed with methylated spirits, eau de Cologne, or brandy (for a very dry skin, brandy with olive oil is the best thing). The chief point is the rubbing, as it is when the vitality is low and the circulation poor that the bed-sores occur, therefore rubbing promotes circulation and is the best preventive. After rubbing, dust well with some fine powder, starch and zinc, or talcum powder. In spite of every precaution, however, bed-sores may occur. They should always be regarded as an unfavorable sign and be reported to the doctor at once.

Some doctors prefer to give directions for treating bed-sores themselves; but if not, various dressings may be used.

First of all, the wound must be kept absolutely clean by bathing it with warm boracic lotion and changing the dressing at least twice a day.

Spread a piece of lint with the ointment you intend to use. Ichthyol, boracic, and witch-hazel are all good. The ointment

should be spread on the smooth side of the lint, and a piece large enough to last for a day or two might be spread at one time and kept in a small tin box.

For the dressing, cut a piece of lint a very little larger than the sore, and after bathing the wound and cleaning carefully round the edges with a swab, apply the dressing, keeping it in its place with strips of adhesive strapping.

If the sore discharges a good deal, it should be fomented three or four times a day with boracic fomentations. The boracic lint should be cut about a quarter of an inch larger than the wound all round and covered with a piece of protective or oil silk a quarter of an inch larger than the fomentation, the dressing being kept in place with adhesive strapping.

If this treatment is not successful, other dressings may be tried, such as red lotion, cyanide gauze, etc. Air-cushions should be used as a preventive.

ENEMATA

An evacuant enema is frequently ordered for constipation, and is usually given with a Davidson's syringe. This is a tube with a bulb in the middle, which acts as a pump. At one end there is a small metal valve to prevent the fluid drawn into the tube from flowing back into the basin. At the other end there is a bone nozzle which is passed into the rectum. The simplest enema is soap and water. Take a quart of hot water and mix into it about an ounce of soft soap. The temperature of the enema should be about 99° F.

Put the syringe into the water and squeeze the bulb several times, allowing the fluid to flow through until there are no air bubbles; place the basin on a chair by the side of the bed. The patient should lie on the left side with the knees drawn up.

Place a folded towel under the pelvis, but keep the patient carefully covered up all the time. Find the anus with the middle finger of the left hand, and with the right hand take the nozzle, which should be well greased with vaseline, and gently place it at this point. Be careful not to force it into the orifice when the muscle is contracted, but wait a moment until it relaxes, when it can be inserted quite easily and without pain or discomfort to the patient. If there is any difficulty with regard to retention, or if the patient is unable to lie on his side, then the enema must

be given with him lying on his back with his knees drawn up and the bed-pan placed under him.

Give the injection slowly. If the patient complains of discomfort before sufficient fluid has been injected, stop for a minute or two without withdrawing the nozzle and then proceed.

After the enema has been given it should be retained for a few minutes. As it is a very unpleasant and exhausting treatment every care should be taken to bring about the desired result without having to repeat it. A simple soap-and-water enema may be made more efficacious by adding a few tablespoonfuls of olive oil to it. In cases of severe constipation, the best method is to give four or five ounces of warm oil first, turning the patient on to his right side to enable him to retain it. Then about an hour after give the soap and water.

Salt Enema.—Two tablespoonfuls of salt to a pint of warm water. Usually given to children for thread-worm.

Castor-oil Enema.—Mix two tablespoonfuls of castor-oil with one ounce of soft soap, beating them up together with a spoon or broad-bladed knife. Add to it slowly, stirring all the time, a pint of warm water. Give in the same way as a simple enema.

Glycerine Enema.—Pour about half an ounce of glycerine into a cup or small basin and stand it into a larger basin of hot water to warm it. Give with a special glycerine syringe or ordinary glass syringe. Fill the syringe with glycerine and expel the air by holding the point uppermost and pushing the piston up until the glycerine reaches the point of the syringe, then inject in the usual way. Glycerine suppositories are often used instead of enemas; they are cone-shaped, and when greased with vaseline are easily inserted.

Nutrient Enemata.—In cases such as gastric ulcer, where it is necessary for the stomach to have a complete rest, the patient may be fed by nutrient enemas. From four to eight ounces of food, if carefully prepared, may be given in this way. The food is usually composed of one and a half ounces of milk, one and a half ounces of strong beef-tea or meat juice, the yolk of an egg beaten up, and half an ounce of brandy, if stimulant is ordered. To peptonize this small amount, take about a third of a peptonizing powder, mix with a teaspoonful of warm water, and stir into the mixture before the stimulant has been added to it. Let it stand in a warm place or in a basin of warm water for ten

minutes, stir it around and add the stimulant. It should be between 96.6° and 99° when injected.

In feeding by the rectum a small catheter and glass funnel will be found much better than the old-fashioned ball syringe. Before giving the nutrient, it will be necessary to give a simple enema in order to wash out the lower bowel. Warm the catheter by running some warm water through it, grease well with vaseline, and gently insert into the bowel from five to six inches. Pinch the tube close to where it is inserted and allow all the air-bubbles to escape. Pour the nutrient into the funnel and allow it to pass into the bowel drop by drop, taking care to refill the funnel and not let any air get into the tube.

As the patient is absolutely dependent on this very small quantity of food, it is most important that it should be retained, so that any carelessness in administering it is almost unpardonable in a nurse. After each nutrient the patient must rest, and every unnecessary movement avoided. If there is any difficulty in retaining it, raise the patient's thighs on a pillow, and press the hips together for a quarter of an hour. Sometimes five or ten drops of opium added to the nutrient just before injecting takes away the uneasy sensation and aids retention; but this would only be ordered if the doctor thought it necessary.

To avoid the irritation of the bowel caused by artificial feeding, a simple soap-and-water enema should be given every second day, and an injection of warm water on the alternate days. Usually a meat suppository is given alternately with a fluid nutrient; this should be covered with vaseline before inserting into the bowel.

The patient should be fed in this way every four to six hours during the day, according to the quantity, and usually one nutrient and one suppository during the night.

Patients fed in this way suffer greatly from thirst, and the tongue and mouth become coated and dry. They should be allowed to wash out the mouth frequently with warm water and a pinch of bicarbonate of soda. Glycerine and borax, with a few drops of lemon juice, applied with a very soft tooth-brush or swab of absorbent cotton on the end of forceps, will help to cleanse the mouth and allay thirst.

ADMINISTERING MEDICINES

All medicines, aperients, and stimulants should be carefully labeled and kept in a small cupboard or on a small table by themselves. Lotions and ointments should be kept on the lower shelf of the medicine cupboard, or on a separate tray.

For administering medicines, have ready, on a small tray, a small bowl with cold water for washing the medicine glass, and a jug or bottle with a little fresh water for adding to the medicine if necessary; and a clean towel, to be kept for medicines only.

In giving medicines, be very careful to carry out the doctor's instructions. If by chance a dose is forgotten or the patient asleep, never make it up by giving a double dose or by giving it more frequently during the day.

Read the directions on the label of the bottle each time the medicine is given, and shake very thoroughly, seeing that all the sediment at the bottom of the bottle is well mixed. Pour from the opposite side of the bottle to the label, so that any drop running down will not soil it.

Aperients are usually ordered to be given on an empty stomach, that is, before meals; tonics and acids to be given after meals. These instructions, when carefully attended to, aid in the efficacy of the remedy.

Medicines should be given in the least disagreeable form possible. Powders should be given in wafer papers. Place a wafer on a saucer and pour over it sufficient cold water to moisten it. Place the powder in the center of the wafer and fold the edges of the wafer over it with the handle of a teaspoon. Give it to the patient in a teaspoon, with a little water to drink after it, warning him not to bite it but to swallow it whole.

Castor-oil, being very unpleasant to take, may be given in hot coffee. Pour a little hot coffee into a glass, then pour the oil into the center of it and add a little more coffee to cover the oil. Hot lemon juice will serve the same purpose. Get the patient to hold his nose and to swallow it at one gulp; in this way he will scarcely notice anything disagreeable.

Mineral waters and salts should all be taken in hot water, and about an hour before breakfast.

In giving medicine to an unconscious patient, open the lips

with a spoon and give the medicine very slowly from a teaspoon, holding the spoon in the mouth until the medicine is swallowed. If the patient holds it in his mouth and will not swallow it, try holding the nose or pressing the throat gently under the chin.

All liniments or external applications should be kept in dark green or blue bottles with red labels. Ointments should be kept in wide-necked bottles, or jars with lids, which should be carefully wiped after use. All prescriptions used during an illness should be kept carefully tied together and dated, so that the doctor might have them to refer to at any time.

Stimulants should be given by the doctor's orders only, and diluted with water or soda-water, according to directions.

Sleeping-drafts should be given when the house is quiet and the patient settled for the night.

POULTICES

The making of good poultices requires practice, neatness, and speed. They should be removed or renewed before they become cold. When they are no longer required, the skin should be gently wiped with a soft towel, and anointed with cold cream or white vaseline if at all red, and covered with a piece of fine flannel or white absorbent cotton.

Applying Poultices.—Make the poultice nearby the patient (but not in the same room), as if it is carried any distance after being made, it loses its heat. In applying it, gently lower one end until it touches the skin; then gradually allow it to come in contact with the skin until it touches the whole area which is to be covered. If these instructions are carried out, no pain will be caused by applying hot poultices.

Slippery-elm Poultice.—Take sufficient powdered slippery-elm bark and stir in water to consistency of a thick paste.

Linseed-meal Poultice.—In preparation, have ready some linseed meal, quite fresh, a kettle of boiling water, a small basin, a broad-bladed knife, a piece of flannel or old linen, some thin muslin or gauze, bandage, absorbent cotton, and safety-pins. Heat the basin and blade of the knife by pouring boiling water into the basin and dipping the knife in it. Pour away that water and then pour in just enough water to make the poultice the size required.

Sprinkle in the meal through the fingers, stirring all the time, mix to a good consistency until the mixture comes clean away from the edges of the basin, and when well mixed turn out on to the piece of flannel or linen or tow. Pour some more boiling water into the basin, dip the blade of the knife in it and spread the linseed smoothly over the flannel, cover it with a piece of muslin and fold the edges of the flannel neatly all round.

Apply as hot as possible, covering with a good pad of cotton. When necessary, keep in position with a bandage fastened with safety-pins.

If the poultice has to be carried from one room to another, put it between two hot plates, to prevent its cooling.

Two or three tablespoonfuls of ground mustard may be added to a linseed poultice just before turning it out on to the flannel.

Bread Poultice.—Put some broken pieces of bread into a small saucepan with sufficient water to cover them. Stir with a spoon until nearly all the water has evaporated; turn on to a piece of soft linen and spread out smoothly.

Apply without anything between it and the affected part. A bread poultice is very cleansing and soothing, but does not retain the heat very long.

Charcoal Poultice.—May be made of bread or linseed according to directions, mixing into the meal or bread about a fifth part of finely powdered charcoal, and apply with nothing between it and the affected part.

Soda Poultice.—Instead of using plain boiling water as for a linseed poultice, use boiling soda and water—a handful of washing-soda to one pint of water. This is a useful application for rheumatism.

Belladonna and Glycerine Fomentations.—Spread three teaspoonfuls of belladonna tincture and glycerine over a piece of lint the size of the affected part and apply it. Then put on an ordinary hot-water fomentation, keeping it in place with a bandage.

Mustard Plaster.—Make a smooth paste of mustard with a little flour added to it. Spread on a piece of brown paper the size required, leaving a margin all round. Cover with a piece of fine muslin and fold down the edges neatly. Apply and keep on from ten to thirty minutes, or as long as the patient can bear it.

A Mustard Leaf.—Soak in tepid water for a minute and apply it with a piece of linen or small towel over it.

Starch Poultice.—Take four tablespoonfuls of finely powdered starch and one of boracic powder. Add a little cold water, drop by drop, mixing it into a smooth, thick paste. Pour the boiling water over it, stirring carefully all the time until it becomes a thick and clear jelly. Let it cool and then spread on old linen the size of affected part. Cover with gauze or muslin and apply it. This poultice is used for skin diseases, such as eczema.

BLISTERS

Wash the skin of the part to be blistered, also a large area around it, with soap and water, preparing it after with a little ether. Paint round the area of the blister with a little oil or vaseline to prevent the fluid running over the surrounding skin.

Paint on the fluid with a small camel's-hair brush and cover with a circle of protective, keeping it in place with two strips of narrow adhesive plaster crossed over the circle.

If the blister has not risen within twelve hours apply a small poultice over the protective.

To Dress a Blister.—Snip at its most pendulous part with a pair of clean, sharp scissors, and press out the fluid with a swab of absorbent cotton. Apply boracic ointment spread on the smooth side of a piece of white lint cut the size of the blister, and keep it in place with two narrow strips of adhesive plaster crossed over it. Renew the dressing twice a day until it is healed.

BATHS

Always use a bath thermometer in taking the heat of the water, as no one can judge the temperature accurately with the hand.

Temperature of hot	bath,	98° to 106° F.
" of warm	bath,	92° to 98° F.
" of tepid	bath,	85° to 92° F.
" of cold	bath,	33° to 65° F.

Time is almost as important as heat in the effect of a bath. Five to ten minutes is, as a rule, long enough for an invalid. Warm, dry towels must be ready to envelop the patient, and all

unnecessary delay in drying and dressing after a bath should be avoided.

Alkaline Bath.—Add half an ounce of bicarbonate of soda to each gallon of water. Used for rheumatism.

Sulphur Bath.—Half an ounce of flowers of sulphur to each gallon of water. Used in cases of skin irritation.

Bran Bath.—Two ounces of bran to each gallon of water, mixing the bran with a small quantity of boiling water before adding it to the bath.

Mustard Bath.—An ounce or more of mustard to each gallon of water. Mix the mustard in a little cold water, and add it to the bath. This is ordered usually as a foot bath, and is excellent for headaches or cold in the head. The water should be as hot as possible. Add more hot water to maintain the heat, and the feet ought to be kept in until the skin is quite red. The patient ought to get into a warm bed immediately after, with hot bottles to keep up the heat.

Cold Sponging.—This is frequently ordered when the temperature of a patient reaches 104° or over. Plain cold water or water with some ice in it may be used. Take a small cot blanket and cover the patient with it, remove the night-gown and turn the patient on to his side, roll another small blanket under him, and proceed to sponge his back. Use a large sponge, and sponge from the neck downward with long even strokes. Sponge the back for five minutes and wipe with a soft towel, turn the patient on his back, and sponge the chest and abdomen in the same way, then the arms and legs, and last of all, with clean, fresh water, the face. The sponging ought to last about twenty minutes, but if the patient becomes blue and collapsed it must be discontinued at once. As all exertion ought to be avoided, it is better in these cases where the sponging is frequent to have night-dresses which fasten down the back like a pinafore; they are so easy to take off and put on.

The temperature should be taken both before and after the bath.

Tepid Sponging.—Sometimes tepid and sometimes hot-water sponging is ordered to reduce the temperature. A little vinegar added to the water is very beneficial, especially in cases of phthisis.

NURSING CASES OF INFECTIOUS DISEASES

The nursing of infectious cases demands more intelligent and conscientious care than any other disease. If the case has to be nursed at home the first thing to be considered is the possibility of complete isolation.

The doctor should be called in as soon as there is any suspicion that the patient is suffering from some infectious trouble.

The room chosen for an infectious case should be in the most secluded part of the house; if possible, the top floor should be isolated, and the nurse with the patient shut off from the other inmates of the house.

All superfluous rugs, hangings, and furniture should be removed from the isolated rooms, cupboards and drawers should be emptied, and only the things necessary for the nurse and patient kept in the rooms. Upholstered furniture should be avoided, as it is more difficult to disinfect.

The nurse should have her meals in her own room, and all utensils, both for her use and the patient's, should be kept apart and not washed with other dishes in the family kitchen. Invalid requisites should all be washed by the nurse herself.

She must realize her responsibility in preventing the spread of infection by taking every possible precaution. She must make up her mind to be isolated with her patient for the time. She must not go out in the dress she wears in the sick-room, and avoid sending letters by post. When the time comes for the patient to be disinfected, the nurse must disinfect herself by taking a carbolic bath and washing her hair and changing all her linen, etc.

Throughout the course of an infectious disease, a sheet wrung out in carbolic 1 to 20 solution should be hung outside the patient's door and kept wet continually.

All soiled linen should be soaked in a bath of 1 to 40 carbolic solution, or in very strong lysol, for some hours. They should then be washed and boiled before they can be considered free from infection.

Blankets and woolen garments which cannot be soaked and washed should be fumigated.

The nurse should wear an extra gown in the sick-room and

take it off when she leaves the room. She should always have a basin of water with lysol ready to disinfect her hands. Each time she attends to the patient she must wash and disinfect her hands and arms, and always before she leaves the room.

The most common infectious diseases which can be nursed at home are chicken-pox, measles, liberty measles, mumps, whooping-cough, diphtheria, scarlet fever, typhoid fever, consumption, and influenza.

Chicken-pox.—This is a very mild disease, common among children. The incubation period is from ten to sixteen days, and quarantine lasts until all the spots have entirely disappeared.

The rash usually appears on the second day, small pimples forming on the head, body, and limbs; later on, the pimples form into scabs, which drop off when the skin is healed underneath. The child should be kept on a light diet and given an aperient when necessary. The skin may be dusted with talcum powder. The child should be kept in a well ventilated room but guarded against chills. After two or three days he might be allowed to go into the garden, but isolated until all the spots have disappeared.

Measles.—Measles usually begins with all the symptoms of a severe cold in the head. The period of incubation is from fourteen to seventeen days, and the rash comes out three or four days after the other symptoms have appeared; it begins on the face, neck, and arms, and feels slightly elevated above the skin.

The discharge from the mouth, nose, and eyes of a patient suffering from measles is very infectious, so that it is better to use pieces of soft rag, which can be burned immediately after use, instead of handkerchiefs.

The temperature is often very high, to begin with. The patient should be well covered up in bed, with a fire in his room night and day to insure an even temperature.

Avoid giving an aperient in the first stage of the disease, as it is apt to bring on diarrhea; if the patient is constipated, a glycerine suppository will probably give relief. Give a very light diet, such as chicken broth, malted milk, barley water, peptonized milk, or whey.

If every care is taken to avoid a chill in the first stage of the disease, the second stage will be quite easily overcome, but in

neglecting these precautions the after-effect of measles may be very serious. Pneumonia and bronchitis are common complications; inflammation of the eyes, discharge from the ears and nose, and convulsions may occur.

The nurse must be on the watch for any rise of temperature, and all suspicious symptoms should be reported to the doctor at once.

When the patient is allowed to get up, a bath should be given every day.

Good, nourishing food must be given during convalescence, and the patient should have plenty of fresh air. The eyes must be protected from the sun, and reading by artificial light ought to be avoided for a month or two.

Liberty (German) Measles.—This is much less severe than the one just described and there is less danger from chills. The rash is similar but is confined to the face and arms.

Mumps.—The period of incubation for mumps is from fourteen to twenty-five days, and quarantine from a month to six weeks after the swelling has gone down.

The patient should be kept in bed for two or three days and hot wool or flannel applied to the swollen glands. Avoid chills.

Sometimes the glands suppurate, and fever, with delirium, may develop; but this is unusual, if every care is taken to keep the patient warm at the beginning of the disease.

As eating is very painful, the food should be soft and easy to swallow—bread and milk, soup, beaten-up eggs, custard, etc. All sour fruit should be avoided, as it increases the flow of saliva, and as the salivary glands are inflamed and swollen, anything sour will cause much pain.

Whooping-cough.—The incubation is about a week, and period of quarantine indefinite.

It is very infectious among children. The cough becomes more violent as the disease progresses, until the characteristic whoop appears. During the paroxysms of coughing the child suffers much, becomes blue in the face and struggles for breath. Hold his head firmly with both hands and let him have fresh air.

The child should be kept in bed so long as there is any rise in temperature, but he should be up and about as soon as it becomes normal. A change of air and good nourishing food will hasten the cure.

TABLE SHOWING DURATION OF INFECTIOUS DISEASES

Disease.	Incubation period after infection and before illness begins.	Day after illness begins on which the eruption		Length of time, after illness begins, at which infection ceases.	Isolation period required after the *latest* exposure to infection.
		appears	fades.		
CHICKEN-POX	10 to 16 days	1st day and 3 following days	About 4th	When every scab has fallen off.	20 days
CHOLERA	A few hours to 10 days, usually 3 to 6 days		..	7 days from complete cessation of diarrhea. Carriers occur.	12 days
CONSUMPTION			..	When the patient has ceased to spit.	..
DIPHTHERIA	2 to 10 days	Membrane appears in throat on 1st or 2nd day	..	In 4 weeks, if no discharges and no albumin in the urine, and if bacteriological examination of nose and throat be negative.	12 days
ERYSIPELAS	3 to 10 days	1st day	..	When rash has gone and desquamation ceased.	12 days
LIBERTY (GERMAN) MEASLES	7 to 18 days or even longer	2nd to 4th	4th to 7th	In not less than 10 days from appearance of the rash.	20 days
INFLUENZA	1 to 4 days, usually 3 to 4 days		..	In 3 days after the temperature has become normal, and all catarrhal discharges have ceased.	5 days
MEASLES	10 to 14 days	4th day. The patient is highly infectious for 2 days before the rash appears	5th to 7th	In not less than 2 weeks from appearance of the rash.	16 days
MUMPS	10 to 22 days		..	In not less than 3 weeks, and then only when 1 week has elapsed since subsidence of all swelling.	24 days
OPHTHALMIA			..	When all discharge and redness of the eyes have ceased.	..
PLAGUE	2 to 8 days, in rare cases up to 15 days		..	In one month.	21 days
PUERPERAL FEVER	3 to 5 days		..	When discharge stops.	..
RINGWORM			..	When examination reveals no broken-off hairs and microscopic examination discovers no parasite in the hairs.	..
SCARLET FEVER	1 to 8 days, usually 3 to 5 days	2nd	5th	When desquamation and sore throat and albuminuria disappear, but never in less than 6 weeks.	10 days
SMALLPOX	12 to 14 days	3rd or 4th	9th or 10th	When every scab has disappeared.	16 days
TYPHOID (ENTERIC) FEVER	7 to 21 days, usually 10 to 14 days	8th or 9th	21st	Indefinite (typhoid carriers occur).	23 days
TYPHUS FEVER	5 to 14, very variable	5th	14th	After 4 weeks.	14 days
WHOOPING-COUGH	7 to 14 days	The characteristic whooping may not appear for 2-3 weeks, although the patient is infectious before then	..	In 5 weeks from commencement, provided all characteristic spasmodic cough and whooping have ceased for at least 2 weeks.	21 days
YELLOW FEVER	3 to 6 days (in mosquito 12 days after biting patient)		..	3 days.	7 days

Diphtheria.—The period of incubation for diphtheria is from twelve hours to five days, and time of quarantine till all germs are gone from the throat. The first symptom is usually sore throat followed by swollen glands; and then an irregular grayish white patch of membrane appears on the tonsils and soft palate, which are swollen and red.

There may or may not be a temperature. In bad cases there is a short, hard cough, with difficulty in breathing. The patient looks very ill, with blue lips, and has a restless, anxious appearance.

In nursing diphtheria at home, the patient must be isolated at once and never left alone for a moment, night or day, until the doctor pronounces him out of danger.

The room should be well ventilated, with a fire in the grate night and day. The patient should be kept lying flat with one low pillow for the head. The heart is usually very much affected by this disease, and sudden deaths have frequently occurred by the patient being allowed to sit up.

Special attention must be paid to the throat; it should be swabbed frequently with whatever lotion may be ordered. Cotton swabs on sponge-holders are the best for this purpose, and burned after use. The tongue should be held down with a tongue-depressor, and someone should hold a small lamp so that the nurse can see the throat quite easily. If a piece of membrane is loose, and covering the larynx so as to make breathing difficult, the nurse should remove it with forceps. Sometimes a throat spray is ordered, or syringing.

In attending to the patient's throat the nurse must be very careful to protect her own eyes and mouth from any particles that may be coughed up.

The patient's feet and legs must be kept very warm, and he should have as much nourishment as possible—meat juice, chicken jelly, beaten-up eggs, milk, or whey, with stimulant if ordered by the doctor.

If a steam-kettle is ordered the best way to concentrate the steam round the patient is to erect a tent at the head of the bed. A threefold clothes-horse is the best thing for this purpose. It should be covered all round with sheets fixed to it by drawing-pins, and then a smaller sheet should be stretched over the top of the screen, hanging a little over the front to form a canopy.

The steam-kettle should be placed on a low stool or chair so that the steam from the spout is on a level with the patient. A steam-kettle specially made for the purpose, with a long spout and spirit-lamp underneath, should be used, and a reserve kettle of boiling water should always be ready to refill the steam-kettle so that the current of steam flows continuously.

Great care must be taken when the patient is recovering not to let him exert himself unnecessarily. For some time after he is better the nurse should bathe him and do everything for him; and on sitting up he should be put first reclining against two pillows, and gradually add more pillows, getting him into an upright position.

As a rule the heart takes months to recover from the poison of diphtheria, so that the patient ought to take things easily and be allowed extra nourishment for some time.

Scarlet Fever.—The incubation period is five or six days, and quarantine six to eight weeks. The rash appears on the neck, face, and breast, and commences as small points, which spread until the whole surface is red. It remains out for three or four days and then fades, when desquamation begins to take place. The best way to prevent the particles of skin from flying about in the air and spreading infection is to anoint the patient all over daily with carbolic or eucalyptus oil.

In scarlet fever the throat affection is sometimes very severe, and so painful that the patient is unable to swallow. Great attention must be paid to it, as the poison may spread to the ears and nose, and permanent deafness be the result.

The necessity of guarding against a chill during the convalescent stage is very important. Nephritis, dropsy, rheumatism, and other diseases may be feared as a consequence of any carelessness in this respect. The slightness of the attack of fever is no safeguard against the patient's susceptibility to contract any of the diseases which scarlet fever leaves.

When the desquamation is quite over the patient is usually kept in isolation for one more week, and should have a daily bath with carbolic or lysol in it. Particular attention must be paid to the hair, as the poison lingers about the roots, and is very difficult to get rid of.

As Bright's disease is a very common complication of scarlet fever during convalescence, the nurse must notice the urine care-

fully, the amount passed, and its appearance. Specimens put up for the doctor should be kept in clean bottles, with the patient's name on the label.

Any puffiness round the eyes should be reported to the doctor at once, or any pain or swelling of the joints, pain in the chest, redness of the eyes, twitching of the face, or headaches. The nurse will be a great help to the doctor if she will notice any of these symptoms and report them to him at once.

The temperature should be taken twice a day for some time after the patient is well, but it need not be charted.

Typhoid Fever.—This fever demands more careful and constant nursing than any other. It is but slightly infectious through the air. The poison is chiefly in the intestinal discharges, the intestine being the seat of the attack.

The patient usually complains of weariness and headache, often some bleeding from the nose, and sometimes pain in the back and limbs; the temperature is pretty high, and the excreta loose and light yellow in color.

A little carbolic or lysol should be put in the bed-pan before use, and some more poured over the motion as soon as it is passed, and the bed-pan should be covered with a well fitting lid. If the doctor wishes to see it, it must be kept in an isolated closet well covered up and a towel soaked in 1 to 20 carbolic placed over it; but if not, it must be emptied at once, with plenty of disinfectant to flush the drain after.

Keep the patient in a strictly recumbent position, always with only one low pillow for his head. The sheet and one small blanket with a small sheet or cover will be sufficient covering if the temperature is very high. It is a good plan sometimes to put a large cradle over the patient's body to keep the bedclothes off him and allow the air to have free course round him. Care must be taken to keep his feet warm, however.

Bathe the patient all over night and morning. Keep a blanket for this purpose, and roll the patient in it before removing the night-dress. Bathe quickly and lightly, and dry, but do not use any friction. Take great care when turning him over to bathe his back so that he does not lift the lower part of his body, but make him lie heavily on the bed and roll him like a log. A little toilet-water added to the water will make the bather feel more refreshed.

Guard very carefully against bed-sores. Rub the lower part of the back, spine, hips, shoulders, elbows, and heels with alcohol and dust with powder. Put the patient on a water-bed if he is thin or if the bed is a little hard. The slightest sign of a bed-sore should be reported to the doctor at once. It may be taken as a bad symptom, indicating a lowering of the vitality.

In making the bed, always have someone to assist, and also in lifting the patient on to the bed-pan, as he should never be allowed to lift himself.

When sponging the patient, notice if there are any spots on the abdomen, and if there are, pencil them round with a blue pencil so that the doctor will have no difficulty in finding them. These spots usually come out in groups and fade after two days. They invariably denote the spread of the disease. Later on in the disease, when the affected part is much ulcerated and inflamed, the walls of the intestine become thin, so that the importance of keeping the patient perfectly still and giving simple fluid diet can be understood. Any effort or movement, or any substance passing through the intestine, might cause perforation.

The temperature should be taken every four hours, and the relation of the pulse-rate to the temperature carefully noted. A sudden drop in the temperature should be reported at once. It may indicate hemorrhage, or it may only be the result of drugs taken to reduce the temperature.

If the patient becomes delirious, he must never be left alone for a moment. If there is any blood in the evacuation from the bowels, do not give any more stimulant until the doctor has been told. If an ice-bag is ordered for hemorrhage, the best way to apply it is to place a cradle over the patient's body and suspend the ice-bag from it, letting it merely rest on the abdomen without its weight pressing on it. A piece of lint should be placed between the ice-bag and the skin.

As patients suffering from typhoid fever usually sleep a great deal and lie fairly quiet in bed, this mode of treatment is easily carried out.

If the patient is drowsy, he may safely be roused every two hours for nourishment. All fluids must be carefully strained. If there is diarrhea, the milk should be boiled, then strained, and a little lime-water added to it. If there is constipation, the milk

must be diluted with plain water or barley water. Sometimes peptonized milk is ordered. About three pints of milk should be given in the twenty-four hours, with some meat jelly or beef-tea as well, and stimulant if ordered by the doctor. The milk may be flavored with a little strong coffee, cocoa, or tea. All foods should be given cold, or even iced.

Every possible attention must be paid to the patient's mouth during this fever. The teeth should be brushed frequently with a soft brush, and the tongue, gums, and roof of the mouth cleaned with glycerine and borax with a few drops of lemon juice added. Swab the mouth with a piece of cotton on a sponge-holder or forceps, burning the swab after use.

As soon as the temperature is down, the patient will become very hungry and crave for some solid food; but the doctor will satisfy himself that the intestine is well healed before he orders any change of diet. First he may have milk thickened with corn-starch or arrowroot; then thin bread and butter without crust; then custard; and about the fourteenth day, if the patient progresses favorably, he may have fish soufflé and thin minced chicken, and so on. There is often much trouble caused by constipation during convalescence. An enema with olive oil in it should be given every other day, and aperients according to the doctor's orders.

As the evacuation from the bowels and urine of a typhoid patient have been known to contain the germ for some weeks after convalescence, care must be taken to disinfect, and the patient must use every precaution long after he is out of the doctor's hands.

Phthisis (Tuberculosis of the Lungs).—This is a very infectious disease, and one in which the patient ought to be as carefully isolated as in any of the more virulent fevers.

This is difficult when the illness is prolonged and the patient feels well and is able to do a good deal of active work; but so long as there is active disease in the lung and the pathological report of the sputum is positive, then the patient ought to be considered infectious and a source of danger to his friends, especially children.

Everything coming in contact with the patient should be disinfected; all clothing and bed-linen should be soaked in strong lysol or 1 to 20 carbolic before they are washed, and woolen

garments should be fumigated. After a long case of tuberculosis of the lungs, the mattress and pillows should be fumigated thoroughly, or else destroyed.

Infection is most frequently spread through the expectoration, and this is comparatively harmless until it is dry. Then it is spread in the air in the form of dust, which is full of the germs of the disease.

A patient suffering from tuberculosis of the lungs should never kiss anyone, and should be very careful, in coughing or sneezing, to use a piece of linen which can be burned. In expectorating, he should use a proper saliva flask with a little carbolic in it, or if in bed, an ordinary sputum-cup.

In nursing acute phthisis (tuberculosis of the lungs), the sick-room should be large and airy, with as much window space as possible. The windows should be wide open, day and night, and the bed as near the window as it can conveniently be placed. All superfluous hangings and carpets should be dispensed with and the room made to look pretty and bright by the wall-paper and color of the woodwork, instead of draperies. There should be one or two pictures, and plenty of flowers are always permissible.

Feeding and fresh air are the two great essentials in cases of this kind. When the temperature is very high, the patient should be sponged with warm water and vinegar. All garments should be changed frequently, especially if the patient perspires much.

As a rule, patients suffering from tuberculosis of the lungs are of a bright and hopeful disposition and are inclined to do far more than their strength will permit. Over-exertion must be guarded against, as it increases the circulation and raises the temperature, making the disease more active. The patient should be kept quiet and excitement avoided. Food should be given frequently during the day and once or twice in the night.

If hemorrhage occurs, keep the patient from moving, and try to allay his nervousness by doing everything for him calmly and steadily. An ice-bag on the chest and a small piece of ice to suck may comfort him and help to stop the hemorrhage. The doctor will probably give an injection of morphia or order an opiate of some kind. A mild aperient should be given as soon as possible after the attack.

If the patient is ill for a long time and requires night nursing, some help will be necessary, as the disease becomes much more infectious as it advances, and the nurse who is tired is much more susceptible to infection than anyone. Indeed, the nurse who is in charge of a patient should have more hours off duty and have better food than while nursing any other infectious case.

So many people say the nurse has nothing to do and is having such an easy time she does not require to go out. They forget that she is living in a poisoned atmosphere all the time she is with her patient, and is always in danger of contracting that most distressing disease herself.

Influenza.—A patient suffering from influenza, however slight, ought to stay in bed and be isolated for two or three days. If this is done the infection is less likely to spread. If the temperature is high, five grains of quinine should be given every four hours. Lemon or orange juice in soda-water should be taken freely, with a light diet. If the cough is very troublesome and the chest painful, a mustard leaf on the chest might give relief, or rub the chest with eucalyptus oil. When the patient is convalescent a change of air is the best way to get rid of the poison, which is apt to linger for days and even weeks, causing much nerve exhaustion. Care should be taken to disinfect the bed and bedclothes and fumigate the room.

DISINFECTING A ROOM

To disinfect a room after an infectious illness proceed as follows: Strip the room as bare as possible; remove all linen and utensils which can be washed and boiled. Scrub the floor and woodwork with soft soap and hot water, open all drawers and cupboards, and spread the contents about the room, then, before the room is dry, stop all outlets and crevices by pasting strips of paper over them. Take some rock sulphur, a quarter of a pound to every hundred cubic feet of air, break it up and put it on a metal dish, and pour a little methylated spirit over it before lighting. The metal dish should be placed in a wide, shallow vessel containing cold water. After lighting wait a minute to see if the sulphur begins to burn. Shut the door of the room and paste strips of paper over the crevices, stopping up the key-

hole. Leave it for twelve hours, then open the windows wide for several hours after. Many people disinfect again by putting down basins of chloride of lime and sealing up the room for another twelve hours, but this would only be necessary after scarlet fever.

This process of disinfection is not sufficient for mattresses, pillows, and books after such cases as scarlet fever. The former should be properly baked and then done up, but the books should really be destroyed. It is better, after both these illnesses, to have the room repapered and painted.

CUPPING AND LEECHING

Cupping is used in cases of deep-seated congestion to draw blood to the surface. It causes sudden dilatation of the superficial blood-vessels, and so probably contracts those of underlying organs. But whatever the explanation, it undoubtedly gives great and immediate relief in difficulty of breathing due to asthma, bronchitis, and heart disease, and relieves congestion of the kidneys in acute Bright's disease. Cupping is of two kinds, *dry-cupping* and *wet-cupping*. To dry-cup, one takes a cupping-glass (or an ordinary thick glass tumbler), puts a few drops of methylated spirit upon a fragment of blotting-paper into it, ignites this, and, while it is still burning, claps the mouth of the glass tightly on the back of the patient. A vacuum is produced, and the skin swells up into the glass as blood rushes into its small blood-vessels. This is repeated four, six, or eight times in different places. Wet-cupping is still more effectual. The skin is first dry-cupped, the swollen skin is next scarified with a lancet or a special instrument for the purpose, and then the cupping-glass is again applied, and blood drawn off into it. Wet-cupping is often used to relieve congestion of the kidneys. Dry-cupping is quite free from danger, but wet-cupping should be left to a medical man.

Leeches are worms which live in water and nourish themselves by sucking blood from other animals. The medicinal leech is about two inches long, and as thick as a goose quill (though it can stretch itself out much farther), of a dark greenish-brown color, and provided at each end with a sucker, which enables it to move about quickly and to hold fast to its victims.

In the middle of its front sucker is the mouth, with three sharp teeth. A leech draws about a tablespoonful of blood, but, after it is removed, bleeding is generally pretty free, and may be encouraged, if desired, by warm poultices. Indeed, the leech should, as a rule, be applied only over a bony part, so that the bleeding can be afterward controlled by pressure; and it should be applied early in the day rather than at night, when considerable bleeding might follow, and not be noticed. Leeches are used in eye inflammations (applied to the temple), in sore throat, in inflammation of the womb, and very largely in some forms of headache and earache, applied behind the ear. There is difficulty sometimes in getting them to bite. The skin must be very clean, being washed with soap and water and thereafter with milk. Any stiff hairs must be shaved away, and the skin may be smeared with a very little blood or syrup. To prevent wandering, the leech should be covered with an inverted wine-glass or a test-tube till it has taken a firm hold. To make the leech let go, a little salt may be sprinkled on it, and it should not be roughly pulled off, or the sucker may be left behind. To stop the bleeding afterward is often difficult. The small wound should be well washed and a pledget of lint tightly bound over it with a bandage, or pressed against it for several minutes with the finger. If this is not effectual some steel drops (tincture perchloride of iron) may be dabbed into the wound, or the point of a piece of lunar caustic (nitrate of silver) inserted into it.

COLD APPLICATIONS

The application of cold to the surface of the body is capable of influencing the progress of disease in deep-seated parts to a considerable extent by acting on the blood at the surface, or through the nerves which end in the skin. Cold is applied for five chief purposes:

To Subdue Pain.—In headache, a wet cloth to the forehead, or sponging with an evaporating mixture of vinegar and water, or eau de Cologne and water, is a well known remedy. Sprains, if treated by holding the injured joint at once under running water, are much relieved. Later on, however, cold applications do harm rather than good, by preventing the absorption of the effused blood. Pleurisy is often speedily rendered painless by

the application of an ice-bag to the side. Small operations may be done painlessly, after freezing the skin of the part by spraying ether over it.

To Lessen Inflammation.—Ice-bags are used in many inflammatory conditions, such as appendicitis, to prevent the formation of an abscess. In meningitis, or inflammation of the membranes of the brain, a coil of tubing, through which iced water runs, laid on the head, very often gives some relief.

To Reduce High Temperature.—In any fever, sponging the arms and legs, one by one, with tepid water is harmless and often very soothing. When the temperature runs very high, i. e. to 105° or 107°, death is often averted by wrapping the patient in a wet sheet and rubbing it with ice, or by putting him in a cold bath.

To Stop Hemorrhage.—In cases of increasing hemorrhage under the skin, for example, a bruised and blackening eye or a sprain, the amount of bleeding, and consequent discoloration, is lessened by applying compresses containing ice or some cooling lotion. In cases of internal hemorrhage, ice may, with great benefit, be sucked if the bleeding be from the lungs, or swallowed in small fragments if from the stomach. Ice-bags are also applied over the chest or abdomen, as the case may be.

As a General Stimulant.—Some diseases are systematically treated in certain countries by cold bathing, for example, typhoid fever. Others are benefited by an alternation of hot and cold bathing, for example, chronic rheumatism. In general debility, one of the best curative agents is the daily cold bath.

TREATMENT OF WOUNDS

Cleanliness is the most important factor in the healing of wounds, and must be carried out in every detail.

Before dressing the wound see that everything likely to be required is ready and close at hand. A small table covered with a clean towel should be placed at a convenient distance from the patient's bed. Place on it two small basins with lotion, one for instruments such as scissors or forceps, and one for swabs for bathing the wound. The lotion to be used for instruments should be carbolic 1 to 40; and for swabs, carbolic 1 to 40; lysol, one per cent.; or a saturated solution of boric acid. The water with

which an antiseptic is diluted should always be boiled. For boracic lotion it is best to make a good quantity and keep it in a well corked bottle; and carbolic should be made up in a strong solution, 1 to 20, and an equal part of boiled water added to it at the time of dressing.

All materials used for dressing a wound should be kept wrapped up in a tin box with a well fitting lid. Gauze if used should be kept in a glass jar with a well fitting stopper, or in a small tin box wrapped in a small towel. Boracic lint should be kept cut up in pieces the size required, also in a tin box. All these dressings could be kept in one fairly large tin box and brought to the patient's bedside at the time of dressing, but not exposed to the air until they are actually required. Have a shallow dish or receiver ready to put soiled dressings in, and when everything is ready wash your own hands and arms thoroughly, brushing the nails with a good hard brush.

Disinfect your hands in carbolic or lysol lotion, and do not dry them, but proceed at once to dress the wound. Wash the wound carefully with the lotion, and place a swab of gauze over the raw surface of the wound while the edges and surrounding skin are thoroughly cleaned.

Cut away any dead skin, and if the wound is on the head, the hair should be shaved off over a considerable area round it.

In bathing the wound, care must be taken not to use the same swab a second time, but each swab, when done with, should be put in the receiver. After the wound is dressed and the patient attended to, all soiled dressings should be burned. When the wound is properly cleansed, apply whatever dressing may have been ordered, gauze, boracic lint, or ointment, cover with a pad of white absorbent cotton and keep in place with a bandage. Suppurating wounds which require fomenting or poulticing should be cleansed in the above manner. If there is much discharge, it may be necessary to bathe more freely. This may be done by placing a basin under the limb and irrigating the wound from above, either by free sponging or by using an irrigator. To apply a fomentation, place a clean towel over a basin with the ends hanging over the edge, place on it a piece of boracic lint the size required, fold the towel over it and pour boiling water on, wringing it as dry as possible. Apply to the wound and cover with a piece of cheese-cloth a quarter of an

inch larger all round than the fomentation. Place a good pad of absorbent cotton over that, and keep in place with a bandage. A poultice may be applied over a wound with gauze or muslin between it and the wound, but never put cheese-cloth or a rubber sheet over a poultice that is used for this purpose.

A wound that has been stitched and is expected to heal by first intention would not, of course, require elaborate dressing or bathing. The first time it is dressed, all that is necessary is to have a fresh dry gauze dressing put on with a clean pad of absorbent cotton, and bandage. Then, the next time, the stitches will probably be removed and a small dry dressing with firm bandage applied for a week or so, gradually lessening the dressing and bandage until the affected part is quite healed.

Ulcers.—An ulcer is a raw, discharging surface, resulting sometimes from bed-sores, burns, or bruised wounds. The first thing to do with an ulcer is to get the wound clean. Wash with lotion as described above and foment at least twice a day—every four hours if there is much discharge. A starch or a charcoal poultice is often very beneficial in these cases.

Sometimes ulcers become chronic and are very difficult to heal. Changing the kind of dressing often helps to hasten the recovery.

Red-lotion Dressing.—This is useful as a stimulant. Cut a piece of lint the exact size of the inside edge of the wound, not large enough to come over the edge (as red lotion is too irritating for the tender new skin forming round the edges of the wound). Soak it in the red lotion, wringing it dry. Then fit it neatly into the wound, the smooth side of the lint next the raw surface, cover with a piece of oil-silk protective a little larger than the wound, place a pad of absorbent cotton over it, and apply a bandage. For a bed-sore, place a piece of dry boracic lint over it and keep in place with strips of adhesive strapping crossed over the middle of the dressing. This dressing must be changed twice a day.

Ichthyol Ointment Dressing.—Spread a fair-sized amount of ointment on the smooth side of the lint with a broad-bladed knife as if you were spreading butter on bread. Fold the lint and keep it in a tin box ready for use. To dress a wound, cut the piece of spread lint the size of the wound (not larger), as the edges are apt to become sodden if a large ointment dressing is

applied; cover with a pad of absorbent cotton, and bandage. If for a bed-sore, cover with a piece of dry boracic lint and strap with strips of adhesive strapping. Zinc ointment, boracic and witch-hazel ointment may be applied in the same way.

In all cases of ulcerated leg, the limb must be kept absolutely at rest. After the dressing is done, a well padded splint should be applied, reaching from the thigh to the ankle, keeping the knee-joint at rest.

Cancer.—In dressing cancerous wounds, which often cover a large surface and discharge a great deal, care must be taken to place the patient in a position in which he will be most at ease, resting against pillows with his head turned away from the wound, so that he may not see it exposed. Be careful, on removing the soiled dressing, to soak off any parts that may be adherent. As these wounds bleed very freely, irrigate gently with warm boracic lotion. Apply an ointment dressing cut in several pieces, as it is easier to remove small pieces than one large one. The outside packing must be very carefully applied, so that the patient is comfortable and the discharge does not soak through to the night-dress or bedclothes.

Wood-wool is a useful packing in these cases. If the wound is very offensive, a layer of carbolized lint placed on the outside of the packing, and not allowed to come in contact with the skin, will help to counteract the smell. Bandages in these cases should be of old linen or calico, and all soiled dressings, bandages, etc., should be burned at once.

Abscesses, Boils, Carbuncles, and Whitlows should all be dressed in the same way as ulcers, and the wound cleansed with lotion and fomentation or poultices applied two or three times a day.

Burns and Scalds.—The first thing to do if anyone is badly burned is to attend to the patient rather than to the wounds. First aid having been rendered at the seat of the accident, it will be the home nurse's chief care to get a bed ready in a warm room, with plenty of blankets and hot-water bottles. The patient should be laid carefully on the bed and covered up with blankets, with hot-water bottles to his feet and sides. Brandy should be given with a little water in it; the bed should be raised at the bottom on blocks or bricks if the patient is faint. Get someone to watch by the bedside all the time, while you get the

materials, etc., ready for dressing the burns. Clean, soft old linen spread with picric-acid ointment is quite the best dressing, but if it cannot be procured for the first dressing, boracic ointment or carron oil (equal parts of linseed-oil and lime-water) will do instead. Remove the patient's clothes, cutting them when absolutely necessary, wash the charred parts with warm water and a little soap, bathing afterward with warm boracic lotion. Apply the dressing, covering with absorbent cotton, bandaging lightly, just sufficiently to keep the dressing in place. If the legs are burned, raise them on pillows and keep the bedclothes off by means of a cradle.

Burns and scalds should be dressed once a day for the first two days; then, when the burned tissue begins to slough and there is more discharge, the dressing should be done more frequently. When the patient has recovered from the shock sufficiently to have a boracic bath it will hasten the healing process. Let him lie in the bath from ten to twelve minutes, keeping up the temperature of the water by adding more hot water and more boracic powder from time to time.

The wounds must be dressed as quickly as possible after the bath and the patient put back to bed. Some stimulant, such as coffee or tea, should be given to prevent collapse.

It should be remembered always that the chief danger from a burn arises from shock, producing heart failure. Especially is this so in young children, where what might appear to be a very trifling burn or scald has been the cause of death. It is always safer to err by being overcautious where a child is concerned, and if only very slightly burned or scalded the child should be put to bed and kept very warm and quiet. If there is any sign of collapse a small quantity of brandy should be given in a little milk. Aperients should be given with caution, as diarrhea is a common complication.

SPECIAL TREATMENTS

For Eyes.—In bathing eyes use warm boracic lotion. Bathe carefully with swabs of gauze or absorbent cotton. In cases of inflammation, apply hot fomentations every two or four hours. If there is discharge, great care must be taken to prevent its spreading to the unaffected eye. Before irrigating, take a swab

wrung out in lotion and remove all discharge surrounding the eye. Then with another swab cover up the unaffected eye. Place a clean towel over the pillow, and let the patient lie down with his head turned slightly to the affected side. Let him hold a flat receiver close to the side of his face, so that the water from the irrigator will run down from the eye into it. A proper china irrigator with a small glass nozzle at the end of the tube is the best thing to use; but if this cannot be procured, siphon a piece of absorbent cotton in a breakfast cup of warm boracic lotion by placing one end of the cotton in the lotion and the other end, neatly pointed, brought over the edge so that when the cup is slightly tilted a thin, steady stream of lotion can be carefully directed on to the eye.

Hold the eyelids open with one hand and guide the irrigator with the other, bathing in this way until all the discharge has disappeared. Then apply the dressing.

If ointment is ordered it should be applied with a fine camel's-hair brush, gently painting inside the lower and upper lid.

Drops should be put in with a proper glass dropper, dropping them into the outside corner of the eye, as, if they are put into the inner corner, they are apt to get into the tear-duct and never get over the surface of the eye.

Throat.—To spray a throat, it is important to do it before and not after food. Use a tongue-depressor or spoon-handle. Spray well to the back of the throat, getting the patient to draw in his breath each time the ball of the spray is compressed. To swab a throat, place the patient so that the light falls on the back of the throat. Use a camel's-hair brush dipped in the application, then, while depressing the tongue with a bent spoon-handle or depressor, brush quickly all round the throat. Cleanse the brush thoroughly before applying a second time. In some cases of sore throat, such as diphtheria or scarlet fever, it is better to use swabs of absorbent cotton on sponge-holders, and these can be burned immediately after use.

Ear.—To syringe the ear, use warm boracic lotion and a large glass syringe; tuck a piece of cotton below the ear and hold a tray, preferably kidney-shaped, close against the neck under the affected ear. Be careful to expel every air-bubble from the syringe by compressing it with the point upward until the lotion comes to the point.

Pass the fluid along the upper wall of the ear slowly and gently, and syringe until the lotion runs out quite clear and clean.

To put in drops, let the patient lie on his unaffected side and drop in the warm oil or warm application with a medicine-dropper or camel's-hair brush; let the patient keep his head in the same position for a minute or two afterward. Put a small piece of absorbent cotton into the ear to prevent the oil running out and soiling the pillow.

In cases of acute earache the inside core of a boiled or baked onion put into the ear as hot as the patient is able to bear it will give relief.

Nose.—In syringing the nose a ball nasal syringe should be used with a vulcanite mount, and the lotion according to what the doctor orders.

NURSING CASES OF FRACTURE

Fractured Leg.—In nursing a case of fractured leg the mattress should be firm and the bed level. In hospitals boards are usually put across the bed under the mattress to make it as unyielding as possible. The injured limb must be kept absolutely at rest to enable the broken bones to unite.

Fractured Thigh.—In a case of fractured thigh the patient should have only one low pillow and should lie on his back. The injured leg is put up by the doctor on a long splint with an extension. Blocks are placed under the bed at the foot, and weights are suspended from the injured leg by a cord over a pulley. Care must be taken not to jerk the weight or cause any movement to the limb.

Guard against bed-sores, keep the draw-sheet very smooth under the patient, and bathe and rub his back carefully twice a day.

Fractured Spine.—It is best to nurse a case of fractured spine on a large water-bed. It is almost impossible to prevent bed-sores, and only by the most careful nursing can one hope to alleviate a little the various discomforts from complications. and often acute suffering in these cases.

The doctor will probably superintend the first lifting and changing of the patient, and he ought to be placed under the

care of two fully qualified nurses until the dangers of the first few weeks are over.

It will depend on the extent of the injury how much paralysis may result, but the chief point in nursing is to be able to place the patient in the least uncomfortable and painful position. Guard against bed-sores, and observe and report on every change in the patient's condition.

Notice any head symptoms, want of sleep, jerking of limbs, control of sphincters, amount of urine passed, if there be vomiting, and the appearance of it, rise of temperature, cough, or any chest trouble.

When the patient has recovered from the first shock of the accident and the nurse has discovered for herself how to make him as comfortable as his condition will permit, she must devote all her energies to making his life in the sick-room as hopeful and bright as possible. There will be days and days of depression to fight against, and hours of suffering with sleepless nights, but there will be bright days also, and hope will revive.

In the summer, when the patient can be carried out to the garden, or wheeled out in a chair, it will be comparatively easy to relieve the monotony of his days; but in the long winter days it will be the nurse's duty to bring the outside life and interests as much as possible into the sick-room.

Fractured Ribs.—This is a very common result of an accident. The ribs should be strapped with adhesive strapping about an inch wide, extending from the breast-bone over the injured ribs to the spine. Four or five strips of strapping will be necessary; over it a roller bandage four to six inches wide should be applied fairly firm around the chest.

The patient will probably be most comfortable lying on the injured side, as in cases of pleurisy. The nurse should watch carefully for any appearance of hemorrhage, as there is always a danger of the lung being injured by the broken ends of the ribs.

Concussion or Injury to the Head.—These cases should be kept in a quiet, darkened room. An ice-bag should be applied to the head, and the patient kept on a low fluid diet until all fear of meningitis has subsided. An aperient should be given soon after the accident, to be followed by a dose of saline, such as Seidlitz powder.

Observe and report carefully on the patient's position in bed —whether the head is thrown back or not. Notice if the eyes twitch, if there is any hemorrhage from the nose or ears, the amount of urine passed, vomiting, or if there is any paralysis.

During convalescence the patient should be guarded against excitement or nerve strain; and even after he is well he should be carefully watched, as brain injuries often become apparent long after the accident has taken place.

Fractured Arm and Collar-bone.—After the bones are set little can be done in the way of nursing except to see that the injured arm is properly supported by a triangular sling.

Always support the injured arm when drawing off or putting on the coat, care being taken when taking the coat off to remove the uninjured arm from its sleeve first, and in putting on to put the injured arm into the sleeve first.

NURSING OF SICK CHILDREN

The nursing of sick children requires infinitely more knowledge, skill, observation, and patience than the nursing of adult patients.

In acute illnesses the child should always be placed under the care of a fully qualified nurse, as a mother is not always able to act with the requisite firmness and decision necessary on occasions of urgency and danger.

Children's illnesses usually run an irregular and rapid course. They will often, at a crisis, lose all rallying power and collapse almost without warning. On the other hand, they will struggle through illnesses which would probably be fatal to an adult. Each case must be watched with the greatest care, and treatments altered and modified according to the effects produced. If one remedy fails, no time must be wasted, but another tried at once. A child's life may hang in the balance for days, but there is always a hope of recovery even when things look at their worst. The nurse must never give up or lose heart.

Food, cleanliness, sleep, fresh air, and light are all important to the child's welfare.

Food.—Generally speaking, children would recover more rapidly if their tastes with regard to food were consulted a little more than is sometimes the case. A child's appetite should

be tempted by the choice and variety of the food given, and by the dainty and attractive way in which it is served.

Some children will refuse a glass of milk, but will take it quite readily if it is nicely warmed with a little tea and sugar added to it, and if it is served in a cup and saucer on a little tray, as for a grown-up person. A resourceful nurse will soon discover the best ways of tempting her little patient to eat.

In all cases where the temperature is high fluids only should be given. Whey or malted milk should be given instead of plain milk, which is too heavy for a feverish child to digest.

As soon as the temperature is down, toast and butter, lightly boiled or poached egg, and baked apples may be added to the diet; and later on, custard, fish, and chicken. The food should be a subject of careful study, and the nature of the illness and condition of the child duly considered. No long periods should elapse between the meals, but the child must be fed at regular intervals during the day and once or twice in the night.

The Toilet.—Next to the food, but just as important, is the cleanliness of the child. The overwhelming prevalence of bacterial diseases among children renders cleanliness in every detail of their lives essential. Not only is cleanliness of the body and clothing required, but of the surroundings and of all who come in intimate contact with the child. Especially important is it to exclude all risk of tuberculous infection from nurse, relations, or friends.

The little invalid should be bathed all over twice a day. The very best soap should be used, as the child's skin is very tender and easily chafed. The towels should be soft and fine and great care must be taken in drying the child, especially in the folds of the skin, round the neck, under the arms, and in the groin. After drying, the skin should be dusted with a fine powder. The child's teeth should be brushed two or three times a day, and the mouth and tongue kept clean with a little glycerine and borax. The hair should be well brushed and combed every morning and evening.

As children have a tendency to throw off their bedclothes if they feel too warm, it is best to have their night-dresses made of fine flannel or nun's-veiling. As a rule, the child is very susceptible to his surroundings, so that great care should be taken to make everything in the sick-room as pretty as possible.

The bedclothes should be changed frequently and kept spotlessly clean; the child's night-dress should be changed two or three times a week, and one kept for day and one for night use. A soft muslin pinafore may be worn over the night-dress and often gives great pleasure to the child, who loves pretty things.

Air, Ventilation, etc.—The choice of room for a child, with its light, heat, and ventilation, would be the same as for an adult patient.

No definite rules can be laid down for nursing particular diseases in children. Remedies and applications are the same as for an adult patient, only they should be modified according to the temperament of the child. An unpleasant or painful treatment may do far more harm than good if the child is terrified every time it has to be repeated. The great point in nursing children is to understand them, using the most suitable treatment for the case.

To lower a high temperature, if the child objects to sponging, inject three or four ounces of warm water or saline fluid into the rectum. This may be given without disturbing the child in the same way that a nutrient enema is given, and will soon lower the temperature and allay thirst. The temperature of the fluid should be about 90° F. the first time, and if repeated it may be given at a lower temperature, 80° to 85° F.

In convalescence, a child's spirits soon shake themselves free of invalid ways; but it is better to go slowly and avoid any complications caused by a premature freedom from restraint. A change of air to the sea or country is always advisable; plenty of good, nourishing food, an adequate amount of sleep and exercise, and the little invalid will soon be restored to health.

NURSING OF CHRONIC CASES

Paralysis.—In many homes the nursing of a chronic invalid forms part of the day's work and the invalid's room is, perhaps has been for years, the center of loving interest and care.

In cases of paralysis where the patient is quite helpless, the nursing is heavy and pretty constant although not anxious work. The most important points to be attended to are the scrupulous cleanliness of the patient and bed and the ventilation of the room.

If a patient is incontinent, the draw-sheet should be changed each time the bed is wet. Short draw-sheets are the best to use in these cases, as it is quite impossible to draw it through and tuck the wet part under the mattress. The smell of urine is very unwholesome and it would be difficult to keep the atmosphere of the room fresh. The back and hips should be bathed with warm water and soap when the draw-sheet is changed, and rubbed well with alcohol and either dusted with zinc and starch powder or rubbed with zinc ointment.

In paralysis where the circulation is much impeded, it is necessary to keep the patient very warm. It is true, he does not feel cold, but he may suffer from its effects by being unable to digest his food properly and kidney and other complications may be the result. There should always be a fire in the room, and the windows should be open from the top, night and day.

In putting hot-water bottles into the bed, care must be taken to have covers on them, as paralyzed patients are easily burned, and the circulation being bad, the slightest burn is difficult to heal.

The prevention of bed-sores is extremely difficult; a water-bed will be a great comfort and will help to avoid the pressure. The position of the patient should be changed frequently. He should be kept first on one side, with a firm pillow down his back to keep him in position, and then on the other side, supported in the same way. Put small pads between the knees and ankles, to prevent their rubbing and causing sores.

To feed a helpless patient, put his head in a comfortable position, turning it a little to the side; put a soft table-napkin under his chin and feed with a small spoon. Plenty of time should be allowed, as there is often much difficulty in swallowing, and the patient may cough and choke if hurried too much.

In nursing an unconscious patient, the same care must be exercised in all that is said and done as if he had all his faculties. One can never tell how much penetrates beneath an apparently unconscious exterior, and it may be that the daily care and attention lovingly bestowed on the body of an unconscious patient may bring untold peace and happiness to his soul.

Chronic Heart Cases.—In nursing these cases there can be no definite rules; only a few suggestions can be made as to what might be helpful.

The patient should be encouraged to be up and about as much as possible, and be allowed to do everything for himself within reason. He may wash and dress himself with a little assistance, except on the days when he has a bad attack or is very breathless after a bad night or any unusual exertion.

Restoratives should always be ready at hand, but not so evident that the thought of an attack is always presented to the patient's mind—a little brandy, a medicine glass, aromatic spirits of ammonia, smelling-salts, and whatever restorative the patient is accustomed to.

If the patient is entirely confined to bed, his room should be as large and airy as possible and the windows kept well opened. There should be a bell within easy reach of the bed, or an electric bell fixed up, so that if he is alone for a short time he can summon assistance at once, if necessary.

All chronic cases should have as much change and variety in their lives as it is possible to give them. A wheel-chair adapted for taking invalids down and up-stairs with the greatest ease and comfort, would be a boon in many a home where there is difficulty in having the patient moved. It can be managed by one person. In this way the invalid could be wheeled downstairs and out into the garden, or moved to different parts of the house. If the sitting posture is tiring and uncomfortable, he should be laid on a couch for a time and put back in the chair to be wheeled upstairs. All these changes mean a certain amount of labor, but the trouble will be amply repaid by the benefit the patient will derive from them.

CONVALESCENCE

When the acute stage of an illness is over, great care and watchfulness will still be necessary until the patient has regained his lost strength. He must be encouraged in his efforts to get well by being allowed to become more and more independent of his nurse.

Special attention should be paid to the food of a convalescent. His likes and dislikes should be considered, although he should not be consulted about his diet.

On getting up for the first time, he should not be fully dressed, but wrapped in a dressing-gown with rugs around him. He

will probably feel very weak and faint and should not sit up for more than fifteen to twenty minutes, the length of time increasing daily until he is stronger.

Friends should be admitted with caution and should never be allowed to stay longer than fifteen to twenty minutes, and two friends, at the most, on one day. A change of air and scene is always advisable after a long illness, and long after he has resumed his ordinary occupations the convalescent should be encouraged to rest in the afternoons and retire early to bed. As the nervous system is always the last to recover tone, quiet and freedom from strain, with good, nourishing food, will help to insure a complete recovery.

TABLE OF DOSES FOR INFANTS AND CHILDREN

Where the adult dose is one teaspoonful, or sixty drops,

A child	3 months or under	should be given	2 drops
" "	from 3 to 6 months	" " "	3 "
" " "	6 to 9 months	" " "	4 "
" " "	9 to 12 months	" " "	5 "
" " "	12 to 18 months	" " "	7 "
" " "	18 to 24 months	" " "	8 "
" " "	2 to 3 years	" " "	10 "
" " "	3 to 4 years	" " "	12 "
" " "	4 to 6 years	" " "	15 "
" " "	6 to 9 years	" " "	24 "
" " "	9 to 12 years	" " "	30 "
" " "	12 to 15 years	" " "	38 "
" " "	15 to 18 years	" " "	45 "
From 18 to 21 years		" " "	60 "

Where the adult dose is one teacupful,

A child	one year or under	should be given	2 teaspoonfuls
" "	from 2 to 4 years	" " "	3 teaspoonfuls
" "	from 4 to 7 years	" " "	1 tablespoonful
" "	from 7 to 11 years	" " "	2 tablespoonfuls
" "	from 11 to 15 years	" " "	3 tablespoonfuls
" "	from 15 to 18 years	" " "	4 tablespoonfuls
From 18 to 21 years		" " "	5 tablespoonfuls
21 years and over		" " "	1 teacupful

DOSES IN DRY MEASURE

Where the adult dose is one dram,

A child	1 year or under	should be given			3 grains
" "	2 years or under	"	"	"	6 "
" "	3 years or under	"	"	"	9 "
" "	4 years or under	"	"	"	12 "
" "	8 years or under	"	"	"	18 "
" "	13 years or under	"	"	"	25 "
" "	18 years or under	"	"	"	40 "
21 years or under		"	"	"	60 "

TABLE OF WEIGHTS AND MEASURES

FLUID MEASURE

Sixty minims or sixty drops	equal	one fluid dram
Eight fluid drams	"	one fluid ounce
Sixteen fluid ounces	"	one fluid pint
Two pints	"	one fluid quart
Four quarts	"	one fluid gallon

DRY MEASURE

Twenty grains	equal	one scruple
Three scruples	"	one dram
Eight drams	"	one ounce
Twelve ounces	"	one pound

HOME MEASURE
(FLUID MEASURE)

One teaspoonful	equals	sixty drops or one dram
One dessertspoonful	"	two drams
One tablespoonful	"	one-half ounce or four drams
One wineglassful	"	two ounces
One teacupful	"	four ounces
One coffeecupful	"	six ounces
One tumblerful	"	eight ounces

HOME MEASURE
(DRY MEASURE)

One teaspoonful	equals	one dram
One tablespoonful	"	four drams
One wineglassful	"	four tablespoonfuls
One teacupful	"	three wineglassfuls

CARE OF THE DEAD

The nurse who has nursed her patient through the last illness will esteem it a privilege to perform the last simple offices.

When all is over, the eyes should be gently closed, and the fingers held over the lids for a minute or two; if the pressure is not sufficient, pads of wet cotton should be laid over the eyelids and removed later. A firm pad or small book should be placed under the chin to prevent the jaw from dropping. Half an hour or more should elapse before washing; in the meantime, everything likely to be required should be got ready and the room tidied. All invalid requisites should be removed, all medicine bottles emptied and put away.

Have ready two clean sheets, one pillow-case, night-dress, white stockings, a soft, fine handkerchief, warm water, soap, towels, and patient's own sponge, comb and brush, etc. Wash quickly under cover of the blanket in the same way as if the patient were alive. See that the finger and toe-nails are absolutely clean, and trim them, if necessary.

Plug the rectum with a long strip of absorbent cotton, using dressing-forceps or the blunt end of a pencil. Put on a clean night-dress and white stockings, and arrange the hair neatly. Roll in a clean under sheet in the same way as in making a bed for a helpless patient, removing draw-sheet and under blanket. Put on a clean pillow-case and place the body in the middle of the bed; straighten the limbs, folding the hands over the chest.

Put on the clean top sheet, removing the soiled one, fold the sheet back over the chest and let it hang over the sides of the bed. Cover the face with a fine handkerchief.

Remove all soiled linen from the room, empty all slops, and put a bowl of strong disinfectant in a convenient corner. Dust the room carefully and leave nothing lying about. Arrange some fresh flowers and put clean white covers on table and dressing-table. Leave the window open about two inches at the top. When death has been due to some infectious disease, the top sheet should be wrung out in carbolic or lysol and water and laid over the bed.

INVALID COOKERY

THE choice and the preparation of food for those who are ill or convalescent are subjects requiring very careful consideration and study. A special attention to diet is one of the leading features in the modern treatment of disease, and in many cases the proper selection and preparation of food, both fluid and solid, are of greater importance than the use of medicine.

There is perhaps no branch of her work where the nurse can be of more service to the doctor than in her ability to feed the patient. In all serious cases the choice of food lies entirely with the doctor, and even during convalescence the diet is often very strictly prescribed. In these circumstances the doctor's wishes must be faithfully followed, as much unnecessary suffering may be caused by giving the patient forbidden food.

At other times, and especially during convalescence, the feeding is left in the hands of those who are doing the nursing. It is then that all one's skill and ingenuity is required to tempt a feeble and very often capricious appetite. The transition from a fever or fluid diet to something more solid must be very gradual, as the digestive organs take some time to regain their normal activity.

All materials used must be of the very best, as there is always less nourishment in inferior food. This does not necessitate extravagant luxuries; in fact, simple foods in season are often more palatable and wholesome than out-of-the-way delicacies.

The invalid's tastes and fancies should be considered as far as possible, and these can generally be found out without actually asking him what he will have for each meal. It is always much better if a dish can come as a surprise. Then, again, variety must be studied, and because a certain dish

has been liked once must be no reason for repeating it too soon or too often.

As a rule, recooked food, especially meat, fish, and vegetables, is unsuitable, although sometimes a dish once served hot may be served up again in a cold form. For this reason invalid cookery should always be done in small quantities, and when a chicken or such like has to be bought specially, it is better to cut it in half or even smaller pieces and cook it in two or three different ways. For instance, half the white meat of a chicken might be stewed or steamed for one meal; the other half made into a cream or soufflé for another meal; and the legs and bones, etc., used to make soup or broth.

Seasoning should be of the very simplest, and any special instructions in this respect carefully followed. The food should be tasted before it is brought into the sick-room. Let all hot dishes be absolutely hot, as anything lukewarm is usually most unpalatable. Then serve them punctually at the time expected. Appetite fails if a meal is long delayed, and an invalid should never be allowed to become exhausted through long waiting.

The manner in which the food is served is also of great importance, and this must never be done in an untidy and careless fashion. The patient himself should first be made ready to receive the meal. If he is in bed the pillows should be shaken up and comfortably arranged, and sometimes the sponging of the face and hands and even a little extra airing of the room will help to promote appetite.

Choose the daintiest dishes for serving, and arrange the food as neatly as possible. Never serve anything in large quantities, and always remember that a small pudding or a small jelly made specially always looks neater and will be more appreciated than a helping taken from a larger dish.

When once the meal is served, see that the invalid is allowed to enjoy it in peace and comfort and without hurry of any kind. Then, when it is finished, remove the tray and all traces of eating.

These little details may seem trivial to one in health, but it must be remembered that the horizon of the sick-room is a very limited one. To anyone confined to it, the taking of food

is among the chief events of the day, and it means such a lot to an invalid to know that someone has given thought and care to the preparation of his meal.

Space will not permit of many recipes being given, but it is hoped that the following, along with the additional hints and suggestions, will help toward the preparing of many useful dishes.

SOUPS

Soups and broths, if well made, are valuable for their restorative properties. As a rule, clear soups and meat teas are considered more digestible than purées and soups that are thickened with some farinaceous substance; but soups with milk, cream, or eggs are useful on account of the additional nourishment they contain.

Invalid meat soups should be made from fresh meat only, and not from stock drawn from a stock-pot. It is generally better to make these the day before they are required, in order that any grease may have time to rise to the surface and be removed. Beef teas and other meat teas are, however, an exception to this rule, as they should be freshly made.

The flavoring should be as simple as possible, in many cases a little salt being sufficient. Vegetable flavoring should only be added when allowed and when the digestive organs are not in a very weak state.

Before serving the soup be most particular to see that all fat is removed from the surface. When in the form of a jelly, this is easily done with a spoon dipped in boiling water, but if liquid, small pieces of kitchen paper must be drawn over the surface.

Soup is best served in a cup and saucer in preference to a plate, as the soup will keep hot longer.

Serve with the soup, and on a plate at the side, a neat piece of bread, some well made toast cut in strips or dice, zwieback, or a few plain biscuits, according to fancy.

If toast is selected, see that it is properly made and not simply bread half browned or blackened on the outside and a flabby sort of dough in the middle, which is much more indigestible than plain bread.

BEEF TEA

Proportions.—(1) To half a pound of beef allow half a pint of cold water and a pinch of salt.

Method.—Choose good juicy beef. Wipe the meat quickly with a damp cloth, cut it in thin slices, and then scrape or shred it down finely with a knife, removing all skin and fat. Put this shredded meat into a clean lined saucepan with the proper proportion of water and salt, and if time permits allow it to soak for half an hour, or until the water turns a bright red color. Then heat slowly over the fire, pressing the meat well with the back of a wooden spoon, until the liquid turns a rich brown color. On no account must the beef tea boil. When ready strain through a fairly coarse strainer (unless clear beef tea is wanted, when muslin must be used), remove all grease from the top, taste if sufficiently seasoned, and it is ready for serving.

(2) Another way of making beef tea, which is better if a larger quantity than half a pound of meat is being used, is to put the different ingredients into a jar, cover it securely, and then steam or cook in a slow oven for three or four hours. Or a double saucepan may be used for cooking it. The beef tea ought to be stirred once or twice during this time to prevent the meat forming into a cake.

How to Vary Beef Tea.—The beef tea may be made more savory by cooking along with it a few pieces of flavoring vegetables or a small bunch of herbs, but this can only be done when beef tea is made by the slower method (2).

If a more substantial soup is required, the beef tea may be thickened by adding to it a small quantity of crushed tapioca. This must be cooked first in a small quantity of water until it turns clear and then the hot beef tea poured on to it. Or, if preferred, a little well cooked rice may be added to the beef tea, or a little cooked vermicelli, to make a variety.

Then, again, the beef tea may be made more nourishing by the addition of one or two tablespoonfuls of cream, or the yolk of an egg, or more strengthening if two or three ounces of raw beef, pounded and sieved, is stirred into it just before serving. The combination of beef tea with hot milk or gruel will also make a very strengthening drink.

Note.—Mutton, veal, or chicken broth can be made in the same way as beef tea, preferably by method (2), but the meat used must be very lean. A mixture of two different kinds of meat together makes a nice variety.

RAW BEEF TEA

Prepare the meat as above and use the same proportions of water. Allow the meat to soak in the water for one hour, pressing it from time to time with a spoon or fork. Strain through a fine strainer and serve in a colored glass to disguise the color. This beef tea should be made fresh each time it is wanted, and two ounces of beef is generally sufficient. It is only given under the doctor's orders, and is frequently added to other drinks, such as gruel, milk, etc.

Beef juice is especially beneficial to infants in cases of diarrhea and dysentery. It is prepared by taking a half pound of freshly chopped lean meat and making same into an oval flat mass. Place in a broiler and slightly brown. Then express the juice with a small meat-press and mix with equal parts of barley-water.

MUTTON BROTH

Proportions.—To one pound of lean mutton allow a pint and a half of cold water, two teaspoonfuls of rice, one teaspoonful of chopped parsley, and a little salt.

Method.—A piece of mutton from the neck or leg may be used. Wipe the meat clean and cut it in small pieces away from the bone, removing as much of the fat as is possible. Put the meat and bone into a saucepan with the water and salt, and bring them slowly to a boil. Then simmer slowly from two to three hours, removing the scum when necessary. When ready, strain and stand until cold. Then carefully remove all fat from the top of the liquid, return it to a clean saucepan with the rice well washed, and cook again until the rice is soft. Add the parsley, very finely chopped, and seasoning to taste.

How to Vary Mutton Broth.—A more substantial dish may be made by serving small pieces of the mutton in the broth. In this case the rice or some fine pearl barley may be cooked along

with the meat, and simply the bones lifted out and the chopped parsley added before serving. The addition of a few finely cut vegetables will make a more savory broth. A little finely shred celery is always a wholesome addition, if the flavor is liked.

VEAL OR CHICKEN BROTH

These can be made in the same way as mutton broth. The inferior parts, such as the legs and carcass, of the chicken may be used; they must be well broken up. A mixture of meats is also good.

FISH SOUP

Ingredients.—One pound white fish, one pint cold water, two ounces milk, two teaspoonfuls butter, one teaspoonful flour, one teaspoonful chopped parsley, pepper and salt.

Method.—Wash the fish carefully and cut it in small pieces, removing any dark-colored skin. Put it into a lined saucepan with the water and a little salt, and bring slowly to a boil. Remove all scum, and as soon as the fish appears cooked, lift out a few pieces free from skin and bone and put them on one side. Allow the remainder to cook slowly about one hour and strain. Then melt the butter in a clean saucepan, add to it the flour, and mix smoothly together. Pour in the fish liquid and milk and stir constantly until boiling. Then add the pieces of fish that were reserved, the chopped parsley, and seasoning to taste. Cook a minute or two longer and serve.

Note.—A richer soup may be made by beating up the yolk of egg in the soup basin and pouring the hot soup gradually on to it; a more savory one, by adding flavoring vegetables to the soup while cooking it.

FISH

Fish is one of the lightest forms of solid food, and a valuable article of diet for invalids.

White fish is more digestible than the oily kinds, such as herring, mackerel, and salmon, and among the most suitable kinds may be named whiting, sole, smelts, haddock, and flounder. The whiting is particularly tender and delicate in flavor, and is

less expensive than the sole; it is frequently called the "chicken of the sea." Oysters also are nutritious and are considered very easy of digestion, particularly in their raw state, but they are not liked by everyone.

The fish used must be of undoubted freshness, and when possible should be made free from skin and bone before serving.

Steaming is one of the best ways of cooking fish for an invalid. Broiling is also good, but frying should as a rule be avoided, unless the fish can be made very crisp and free from grease. Fish prepared in the form of a cream or soufflé is also light and delicate for anyone with a weak digestion.

White sauce should not be served with the fish when the lightest form of nourishment is wanted, as it tends to make the dish richer and heavier, but if well made may be given to those of a stronger digestion.

Salt and lemon juice are the safest and simplest seasonings, and the latter helps to make the fish whiter. Most fish dishes are improved by being garnished with a little parsley and thinly sliced lemon.

TO STEAM FISH

Take a small quantity of filleted fish, wipe it, and cut it in neat pieces. Place these on a greased plate, season with salt and lemon juice, cover with greased paper, and put a second plate or saucepan lid on the top. Place this over a saucepan containing boiling water, and keep the water steadily boiling until the fish has quite lost its transparent appearance. It will require about twenty minutes. When ready serve the fish on a clean hot dish, pouring the liquid which has run from it over and around. Dry toast or a little thin bread and butter may be served separately.

Note.—A mutton chop may be cooked in the same way.

FISH SOUFFLÉ

Ingredients.—One-quarter pound uncooked white fish, one large tablespoonful bread-crumbs, a small piece of butter, two tablespoonfuls milk, seasoning, and one egg.

Method.—Shred the fish finely with a knife, if possible. Put the milk into a saucepan with a piece of butter the size of a walnut, and heat them over the fire. Add the bread-crumbs and

cook a few minutes until these swell and absorb the milk. Add this bread panada to the fish and rub all through a wire sieve, being careful to scrape the sieve underneath. Put the mixture into a basin, season with pepper, salt, and a little lemon juice, and stir in the yolk of an egg. Whip the white of egg to a stiff froth and mix it in lightly at the last. Pour the mixture into a well greased cup or basin, filling it not more than three parts, and cover it with greased paper. Steam slowly for about fifteen minutes, or until the soufflé feels firm to the touch. Then turn out carefully on to a hot plate and garnish with parsley. Serve with brown bread and butter or dry toast.

FISH CREAM

This may be made in the same way as the above soufflé by adding two tablespoonfuls of whipped cream to the fish and bread-crumb mixture instead of the egg.

FISH AND BREAD SAUCE

Ingredients.—One-quarter pound filleted fish, one-half teacupful milk, one dessertspoonful butter, one tablespoonful bread-crumbs, one teaspoonful chopped parsley, seasoning.

Method.—Wipe the fish, and make little rolls of the fillets or cut them in pieces. Put them in a lined or earthenware saucepan with the milk, butter, and seasoning, and cook them slowly until tender. Then lift out the fish, arrange the pieces neatly on a plate, and keep them hot. Add the bread-crumbs to the liquid in the saucepan and stir over the fire until they swell and thicken. A little more milk or a tablespoonful of cream may be added if necessary. Sprinkle in the parsley, cook it a minute, and then pour this sauce over the fish. Garnish with cut lemon and serve plain bread or zwieback separately.

BAKED FILLETS OF FISH

Cut a small filleted fish in neat pieces and season with white pepper, salt, and a little lemon juice. Grease a small fire-proof dish and sprinkle it with fine bread-crumbs, chopped parsley, and a little grated lemon rind. Lay the pieces of fish on top of

this and cover with more bread-crumbs, etc. Pour one or two tablespoonfuls of milk around, place some small pieces of butter on the top, and bake in a moderate oven about fifteen minutes. Serve in the same dish, wiping first around the edges, and garnish with a little parsley.

MEAT

In the order of digestibility, chicken perhaps comes first, and the white meat from the breast and wings is more tender than the legs. Partridge, quail, and grouse are also light and digestible, and form a nice variety when they are in season. Young pigeon is also suitable, but not ducks and geese, as they are too fat. Rabbit is not of very much value in the sick-room, but if young and carefully cooked it may be given as a change now and then.

After game and poultry, mutton is generally given before beef, and young meat, such as veal and lamb, is considered less wholesome. Pork and salted meats should never be given to an invalid, with the exception of bacon, which, if lightly toasted or well steamed or boiled, supplies a very wholesome form of fat. Tripe and sweetbread are also light and delicate, and calf's brains may be given if liked, but the other internal meats, such as liver, heart, and kidneys, should be avoided. Calf's feet and calf's head are other wholesome dishes, and easily digested if well cooked.

Game and all white meats require thorough cooking, but mutton and beef are often more digestible if underdone.

Grilling, steaming, roasting, and boiling are among the simplest methods of cooking meat, but frying and most forms of stewing are too rich for sick-room use.

GRILLED CHOP

A chop from the loin is best, and it should be cut not less than one-half inch thick. First see that the fire is clear and bright; if smoky, sprinkle a little salt over it. Then wipe the chop, trim off the skin and most of the fat, and brush it over on both sides with a little butter. Heat the gridiron and grease it also with butter or a small piece of the mutton fat. Place the chop on it

and cook in front of or over the fire, turning it every few seconds. The time will depend on the thickness of the meat and upon whether the chop is wished well or underdone. It must be nicely browned on both sides, and from six to eight minutes is generally sufficient to cook it. When ready, place the chop on a very hot plate and serve at once.

Note.— A piece of steak from the rump or fillet may be cooked in the same way.

MEAT JELLY

Ingredients.—Put one small carrot and one small onion to fry in a little butter with a slice of bacon in a saucepan (a small piece of celery may be added). Let it all fry together for about ten minutes, taking care it does not burn. Take two pounds either of veal or shin of beef, or a chicken; cut it up and put into the same saucepan with the fried vegetables with two pints of cold water and a teaspoonful of salt; let it simmer till it is reduced to about three fourths of a pint. This will take about six hours. Then strain off through a fine strainer, and when cold take off the fat. It will then be ready for use.

If preferred, the meat can be put in an earthenware jar in the oven instead of in the saucepan.

Raw meat pulp is made by rubbing meat through a grater, when it may be made into sandwiches flavored with a small quantity of anchovy paste.

Raw meat pulp may also be run through a meat-chopper and made into sandwiches.

CHICKEN "EN CASSEROLE"

Ingredients.—One-half chicken, one cupful water or clear broth, one stick celery, one teaspoonful corn-starch or arrowroot, one yolk of egg, seasoning.

Method.—Cut the chicken in small joints, removing as much of the skin as possible. Put the pieces into an earthenware casserole and pour in the water or veal or chicken broth. Add salt to taste and the celery cut in fine shreds. Cover closely and cook slowly, either in the oven or over the fire, until the chicken is tender, from an hour to an hour and a half. When ready lift

out the pieces of meat and add the arrowroot or corn-starch, mixed with a little cold water, to the liquid in the casserole. Stir until boiling and boil two or three minutes. Then draw to one side and stir in the yolk of egg. Return the pieces of chicken and let them reheat thoroughly, but do not boil again. A little chopped parsley and cream may be added if liked. Serve in the casserole.

CHICKEN CREAM OR SOUFFLÉ

These may be made in the same way as fish cream or fish soufflé given above by substituting the raw breast of chicken for the fish.

PANADA OF CHICKEN

Ingredients.—The breast of a small chicken, one dessertspoonful cold water, two tablespoonfuls cream, a pinch of salt, and a squeeze of lemon juice.

Method.—Use only flesh from the breast, wipe it, and cut it in small pieces. Put it into a small basin with the water and salt, cover, and steam until tender. Then pound the contents of the basin in a mortar and rub them through a wire sieve. Add the cream and lemon juice and reheat in a small saucepan. Serve in a dainty dish or scallop shell with dry toast. Or, if preferred, the panada may be served cold.

SWEETBREADS COOKED IN MILK

Ingredients.—One calf's sweetbread, one cupful milk, one teaspoonful corn-starch, one or two tablespoonfuls cream, one teaspoonful chopped parsley, seasoning.

Method.—Choose a very fresh heart sweetbread and soak it in cold water for an hour. Then place it in a saucepan with fresh cold water to cover it, bring to a boil and throw the water away. Rinse the sweetbread again in cold water, pull off all skin and fat, and break it into small pieces. Put these into a lined or earthenware saucepan with the milk and seasoning to taste, cover, and cook slowly until tender, from an hour to an hour and a half. Then lift out the pieces of sweetbread and add the corn-starch, mixed with a little cold milk or water, to the milk in the

saucepan. Stir until boiling, add the cream and parsley, and return the sweetbread to reheat. Serve garnished with a few strips of toast.

Note.—The yolk of an egg may be added instead of the cream, but the sauce must not boil afterward.

PUDDINGS AND DESSERTS

Puddings and other sweets for an invalid must be as light and delicate in flavor as possible.

If made of a farinaceous substance, such as rice, barley, sago, etc., it is most important that this be well cooked, and the mixture must on no account be solid in texture. If an egg is added the white should be beaten up separately from the yolk, as this introduces air into the pudding and makes it lighter.

Care, too, must be taken in the amount of sugar and kind of flavoring added. It is always safer to under-sweeten, and the flavoring must be of the very simplest, such as lemon or orange rind, bay-leaf, nutmeg, cinnamon, or vanilla.

If a pudding has been baked in the oven see that the dish is wiped clean before serving it.

Jellies are always refreshing, and are generally acceptable to invalids. Although not in themselves nourishing, they are often a means of giving stimulant and other restoratives. They must never be stiff, but should melt away in the mouth without requiring any mastication. Use the finest gelatine for stiffening purposes.

CUP CUSTARD

Ingredients.—One egg, one-half teacupful milk, one teaspoonful sugar, grated lemon rind.

Method.—Beat up the egg with the sugar and a very little grated lemon rind, or any other flavoring preferred. Add the milk and strain all into a cup or small basin. Cover with greased paper and steam very slowly until set. Turn out carefully and serve plain or with a little cream.

Note.—This little pudding may be varied by adding to it a few biscuits or sponge-cake crumbs, or by putting a little stewed apple, or even a stewed fig cut in small pieces, at the bottom of the cup before pouring in the custard. Or, again,

a little strong, clear coffee or a teaspoonful of brandy or whisky may be mixed with the milk to give flavor.

STEWED PRUNES

Ingredients.—One-half pound prunes, two or three ounces sugar, cold water, rind and juice of half a lemon.

Method.—Wash the prunes carefully and soak them for a few hours, or overnight if possible, with the cold water, sugar, and the thinly peeled lemon rind. Then turn the prunes into a lined saucepan with the liquid, put the lid on the pan, and stew very slowly for twenty minutes, or until they are tender.

Note.—If preferred the prunes may be steamed in a jar, but they will require longer time. Other flavorings may be used, such as cinnamon stick, orange rind and juice, or a little red wine.

CREAM BLANC-MANGE

Ingredients.—Two ounces milk, two ounces cream, one-quarter ounce gelatine, one teaspoonful sugar, flavoring.

Method.—Put the milk and gelatine into a small lined saucepan with a little flavoring such as a bay-leaf or a few drops of vanilla. Cover, then stand the saucepan over the fire until the milk is flavored and the gelatine dissolved. Then strain into a basin, mix in the cream, and sweeten to taste. Stir the mixture occasionally until almost cold, pour into a small wetted mold, and put in a cool place to set. When required, turn out and serve plain or with a little fruit jelly.

ORANGE JELLY

Ingredients.—Three oranges, one lemon, one-half ounce gelatine, two ounces sugar, three ounces cold water.

Method.—Wipe the lemon and one of the oranges, and peel the outside yellow rind off them very thinly. Put this into a lined saucepan with the water, gelatine, and sugar, and stir over the fire until the gelatine is melted. Then simmer slowly from ten to fifteen minutes to extract the flavor from the rind, and strain into a basin. Add to this the strained juice of the oranges and lemon, mix well, and put in a cool place to set.

This is not a clear jelly, but it is easily made and is very refreshing. A little cream may be served with it.

JUNKET

Ingredients.—One-half pint fresh milk, one teaspoonful prepared rennet, one teaspoonful sugar, a pinch of salt, one teaspoonful brandy.

Method.—Make the milk lukewarm and pour it into a glass or china dish. Add to it the salt, sugar, brandy, and rennet, and mix with a spoon. Then let it stand until firm. If liked, a little grated nutmeg or cinnamon may be sprinkled over the top. Serve with cream. This is a very pleasant form of taking milk and makes a nice variety when an invalid is on milk diet.

INVALID DRINKS

GRUEL

Ingredients.—One dessertspoonful fine oatmeal, one-half pint milk, salt or sugar to taste.

Method.—Mix the oatmeal smoothly with a little of the milk, and heat the remainder of the milk in a saucepan. Add the oatmeal to the hot milk and stir over the fire until boiling. Cook slowly for fifteen minutes, stirring occasionally, and if it becomes too thick add a little more milk. Add salt or sugar to taste, then strain, and serve very hot.

Note.—Water may be used instead of milk, and a tablespoonful of cream or a small piece of butter may be stirred in just before serving. A little brandy or rum is sometimes added. Barley meal may be used instead of oatmeal; it is very nourishing and makes an agreeable change.

Water used should be drawn, boiled and then used at once. It not only sterilizes but has a better flavor.

BARLEY-WATER

Ingredients.—One tablespoonful pearl barley, one pint cold water, juice of half a lemon, sugar to taste.

Method.—Wash the barley, put it into a lined saucepan, and cover with cold water. Boil this a few minutes, then strain

and rinse the barley with fresh cold water. This will whiten it and prevent the drink having a muddy appearance. Now return the barley to the saucepan with the pint of cold water and cook slowly from one and a half to two hours, adding more water if necessary. Strain off the liquid, add sugar to taste, and, if liked, the strained juice of half a lemon. Serve either hot or cold.

Note.—Barley will not keep long; it should be made fresh every day. It is frequently mixed with milk; in this case, no lemon juice should be added. It is a very light and nourishing drink and is good for quenching thirst.

RICE-WATER

Make this in the same way as barley-water, but allow a shorter time for cooking. A small piece of cinnamon stick is often used for flavoring. A little brandy or wine may be mixed with the rice-water if stimulant is required.

EGG DRINKS

There are many different ways of making these, of which the following are a few examples. In all cases the eggs used must be of the very freshest and the tread or speck must be removed.

(1) Beat up an egg with a tablespoonful of sherry or one dessertspoonful of brandy and one teaspoonful of sugar, without making them too frothy. Add a teacupful of hot milk and strain into a tumbler. The white of egg may be omitted.

(2) Beat up the white of an egg to a froth but not too stiff. Put it into a tumbler and pour a cupful of hot milk gradually on to it, stirring all the time. A little sugar or a pinch of salt may be added if wished.

(3) Beat up the white of an egg to a stiffish froth and put it into a tumbler. Add one or two tablespoonfuls of cream and one tablespoonful of brandy or wine. Mix all together and serve. Sugar may be added if wished.

(4) Beat up the yolk of an egg with a teaspoonful of sugar and two tablespoonfuls of milk or cream. Put this into a tumbler and fill up with soda-water.

LEMONADE

Ingredients.—Two fresh lemons, one pint boiling water, a little sugar.

Method.—Wipe the lemons and peel the yellow rind off them as thinly as possible. Put this into a jug, strain in the lemon juice, add the sugar, and pour the boiling water over all. Cover and stand until cold. Then strain off as required.

Note.—The lemonade may be made with less water, and soda-water added before serving; or rice or barley water may be used. Another nice drink is made by adding half a glass of sherry and one egg to half a tumblerful of lemonade; whisk all together, strain, and serve. Orangeade may be made in the same way, or an orange and a lemon together make a pleasing combination.

WHEY DRINKS

In these drinks the curd, which is the heaviest part of the milk, is strained out, and the whey, or watery part, only is served. They are very light and easily digested.

(1) Heat half a pint of milk to a lukewarm temperature and add to it one teaspoonful of prepared rennet. Let this stand in a warm place until a curd is formed. Then break it up, strain through muslin, and the liquid is ready to serve.

(2) Put a teacupful of milk into a saucepan and bring it to a boil, add half a glass of sherry and sugar to taste. Keep this over the fire until it curdles, then strain through muslin.

(3) Make in the same way as No. 2, using one tablespoonful of lemon juice instead of the wine.

A little cream may be added to any of these whey drinks after straining.

ARROWROOT

Ingredients.—A dessertspoonful of arrowroot, half a pint of milk.

Time required, about a quarter of an hour.

Take a dessertspoonful of arrowroot and put it in a small basin, add a dessertspoonful of cold milk, and stir smoothly into a paste with a spoon, adding a small teaspoonful of sugar, according to taste. Take a small saucepan and put half a pint

of cold milk in it; put the saucepan on the fire, and when it is quite boiling pour it on to the arrowroot paste, stirring all the time.

A more nourishing preparation may be made by adding to the mixture above the yolks of two eggs, whipping it all well together. The eggs should not be added until the mixture has cooled a little, or they will curdle.

KUMISS

Proportions.—One pint cool, fresh milk, two teaspoonfuls sugar, one-sixth cake yeast.

Method.—Add the sugar to the milk, which must be absolutely fresh and cool; shake thoroughly, and pour into a clean bottle which has a stopper that can be fastened, as the development of carbonic acid gas will force an ordinary cork out unless it is tied. Add the yeast; cork tightly and place in a water-bath at from 99° to 100° F. for eight or ten hours. At the end of this time place the bottle on ice; when cool use as needed.

PEPTONIZED FOODS

Peptonized foods are of the utmost value in cases where the digestion is so weak that milk and other foods cannot be taken in their ordinary form. They should only be given under medical orders, and when it is necessary to give the digestive organs rest for the time being.

During the process of peptonization the foods are digested or partly digested by means of a ferment. This ferment, or peptonizing agent, can be obtained either in liquid or in powder form, and full directions for use are given with each preparation. The following simple recipes in which liquor pancreaticus is used will help to illustrate the general principles of the process.

PEPTONIZED MILK

Proportions.—One pint new milk, two ounces water, two teaspoonfuls liquor pancreaticus, twenty grains or half a level teaspoonful bicarbonate of soda.

Method.—Put the milk and water into a saucepan and heat them to 140° F., or, if no thermometer is at hand, bring half

the quantity of liquid to the boil and add to it the other half cold. Pour the liquid into a jug and add the soda and liquor pancreaticus. Cover to keep out the dust, and stand in a warm place for half an hour or an hour, according to the degree of predigestion required. As the process of peptonization goes on a slight bitterness is developed, which is objectionable to some palates, but a few trials will indicate the limit most acceptable to the individual invalid. As soon as this is reached, the milk must either be taken at once or boiled to prevent the further action of the ferment. It will then keep like ordinary milk.

Peptonized milk may be mixed with equal parts soda, Vichy, or other carbonated water, and a little crushed ice may be added.

PEPTONIZED BEEF TEA

Proportions.—Half a pound lean juicy beef, one pint cold water, one tablespoonful liquor pancreaticus, twenty grains bicarbonate of soda.

Method.—Shred down the meat finely and put it into a lined saucepan with the water and soda. Heat gradually, stirring all the time, and then simmer *very* slowly at least half an hour. Then pour into a jug and cool down to a lukewarm temperature, not exceeding 140°F. Add to it the liquor pancreaticus in the above proportions, and stir well. Cover the jug and keep warm one hour or longer, stirring occasionally. At the end of this time bring the beef tea to the boil, and strain off the liquid part ready for use.

PEPTONIZED BEEF-TEA JELLY

Proportions.—Half a pint peptonized beef tea, half an ounce French sheet gelatine.

Method.—The beef tea must first be boiled to stop the peptonizing process, otherwise the ferment would act on the gelatine and destroy its stiffening property. Put the beef tea into a saucepan with the above proportion of gelatine, and stir over the fire until dissolved. Then strain into a small mold or basin that has been rinsed out with cold water, and keep in a cool place, or on ice, until set. Then turn out and serve cold.

DIETS AND FOOD VALUES

THE NUTRITIOUS PRINCIPLES ILLUSTRATED PRACTICALLY

DIETETICS may be defined shortly as the science which treats of foods and feeding. It is to be noted that these words are employed in their most expansive sense to include all alimentary substances which can be or are customarily used by man for nourishing or aiding in the nutrition of his body. As the fundamental object of food is to build up and maintain the body in a condition capable of meeting the demands made upon it by daily life, our first duty will therefore be to obtain an accurate conception of the composition, from a chemical aspect, of the human body.

Dietetic Principles.—The body is in many respects comparable to an engine. Like a piece of mechanism it requires fuel to supply the muscles, etc., with energizing power for the various bodily activities, and it likewise needs building materials to repair loss from wear and tear. For the latter purpose, food containing nitrogen is necessary, the proteid of which the muscles and other tissue are composed being replaceable only by fresh nitrogen-containing proteid. For the necessary supply of energy, on the other hand, proteid would suffice; but, as its use for this purpose would throw upon the kidneys and other excretory organs the necessity of getting rid of a large residue, fats and carbohydrates (including starch and sugars), which contain only carbon, hydrogen, and oxygen, are more convenient for the purpose. In addition to these three varieties of food, water must be taken in sufficient quantity to make up for the loss by the urine, sweat, etc., and also various salts, of which, however, there is always a surplus in the food.

A healthy man of average size and weight, doing a hard day's work, gets rid, in his excretions, of effete products correspond-

ing to some 120 grams (4 ounces) of proteid each day, and should take just sufficient proteid food to make this up. If he takes too little, the muscular tissues grow smaller and less capable of resisting disease; if he takes too much, the digestive and excretory organs are apt to give way under the strain and various diseases result. Up to a certain point, however, the excretory organs can overtake a surplus of proteid, and expelling it from the body in greater amount, maintain what is called the "nitrogenous equilibrium."

Calory.—The mode of expressing the food requirements is stated in terms of energy-producing power. "Kilo-calory" is the name applied to the amount of heat necessary to raise the temperature of a kilogram of water (2 pounds) 1° C., and of these calories of energy 4.1 are obtainable by burning a gram of proteid or of carbohydrate, and 9.3 by combustion of the same amount of fat. In estimating the energy expended by an individual in climbing a mountain, doing his daily work, etc., one expresses it as so many "calories," while the amount of food which is burned up in the body by the process may be similarly stated.

Quantity of Food.—The total daily amount of food necessary for a fair-sized man, doing average hard work, must provide about 3000 calories of energy, and since rather over 4 ounces of the daily food must be proteid, to supply wear and tear, this leaves 2500 calories to be supplied by carbohydrate and fat together. The proportion of these to one another depends upon minor considerations; for example, the Esquimaux make it up in fat, because, in the northern regions, sugar and cereals are unobtainable. The natives of India, and the poorer classes of the world in general, use cereal food because of its great cheapness as compared with fat, and persons of feeble digestive power consume large quantities of soft fats, because—fat being, bulk for bulk, more than double the caloric value of carbohydrate—the digestion of a sufficiency of food is rendered easier by the use of the former in excess. In general it is found that the fat should be about one tenth of the carbohydrate part of the diet. The ideal then is probably about—proteid, 120 grams; fat, 50 grams; carbohydrate, 500 grams; yielding over 3000 calories of energy.

Quality of Food.—After the energizing power of a substance has been ascertained, there remain several other factors which

determine its suitability as a food. *Digestibility* is one of the most important, for, while petroleum, sawdust, and the like have a high energy-producing power, they are absolutely useless as foods. *Absorbability* is also of importance, for few substances are completely absorbed into the system, and some, like vegetable proteids and white of egg, are even rejected if taken as food in large amounts, and passed by the bowels unchanged. Thus a considerable amount of all food eaten, and especially of the coarser kinds, remains unused. *Satisfying power* is of great importance, and depends partly upon the bulk of the food and partly upon its preparation. Food should not be capable of too rapid digestion, or it cannot be fully utilized by the tissues; hence a food like oatmeal is more sustaining in persons of good digestive power, than meat essences; and hence also the value of cooking certain foods with fat, which, when it penetrates the other food, retards digestion. As a rule, the more satisfying a food is, the less digestible it proves; and this is one of the chief reasons that different foods and different methods of cooking suit persons of diverse physique and digestive powers. *Preparation* by grinding, cooking, etc., is also important. The effect of cooking is partly to develop flavors in the food, and so make it more palatable and digestible; partly to kill organisms and animal parasites which may be present in it; and, mainly perhaps, in the case of meats, to soften the connective tissues which bind the meat proper, and in the case of vegetables, to burst or tear the fibers and capsules of cellulose which surround the starchy and sugary material. *Cheapness* is of immense importance to the working-classes. Animal proteid, as beef, forms the dearest food, and bread is by far the cheapest, well deserving the name of "the staff of life." Among the cheapest and most efficient forms of proteid-producing food, after bread, come skimmed milk, cheese, and fish. Fat, as stated above, has double the energy-producing power of carbohydrates, but nevertheless butter is more than four times as expensive as its equivalent in bread. Hence fatty foods receive the general name of "rich foods." Nevertheless margarine falls into the list of cheap foods, and proves to be quite as nutritious as butter.

The source of food is not indifferent. It might be thought that a person well fed on peas would have the same powers as one

fed on their equivalent in beef. Considered as mere machines for doing work, men might find this quite true, but the conditions under which work can be done vary in the two cases. Those races and individuals who feed upon a largely animal diet are characterized by the power of doing work more rapidly, by greater spirit, and by greater power of resisting disease. As a general principle, this is undeniably true, and it forms the main argument against the suitability of vegetarianism for those persons doing severe work involving any mental or highly skilled effort.

Dr. Salisbury of New York goes to an extreme in advocating lean meat and water as a healthy diet. Though his system is useful in the treatment of obesity and some forms of dyspepsia, it can be tolerated by very few persons for any length of time. The great objection to *vegetarianism,* on the other hand, apart from that stated above, lies in the enormous bulk of vegetable food necessary, mainly in consequence of its wateriness. Thus, if one were to subsist on nothing but lentil porridge, about five pounds of it would be necessary daily; or if one lived solely on green vegetables and succulent fruits, the impossible weight of about thirty pounds every day would be necessary to a fairly hard-working, healthy man. Those vegetarians who add milk, eggs, and cheese to their food reach at once a healthy and rational diet, and one which, in those liable to gout, rheumatism, and similar conditions, is often more salutary than a full ordinary diet.

External conditions produce great differences in the need for food. In cold climates, or in those persons unusually exposed to the weather, a special addition of fats or carbohydrates must be made to the diet in order to maintain the body heat. For the same reason a tall, spare man requires a much greater supply of these foods than a short, fat man of the same weight.

Age and sex are important considerations. A woman requires about four fifths of the diet of a man about the same size and build, the reduction affecting chiefly the starchy and sugary elements of her food. Children require much more proteid—that is, building material—in proportion to their size than adults; while old people, on the other hand, if they wish to keep healthy, must be very sparing eaters, particularly of animal foods.

Nature, the Great Food Alchemist.—Proteins, fats, and carbohydrates constitute the organic section of the alimentary principles, and are obtained, at least in the first instance, from the vegetable kingdom. The atmospheric air contains carbonic acid, likewise derived from the activities of living animals. Plants alone are able to utilize carbon and with the aid of water build it up into carbohydrates. These are eaten by animals, and after being used by them are excreted in the form of carbonic acid and water. Animals after their death therefore become the food of plants, and so it is only right and proper that they in their turn should become the food of animals. Plants again can extract nitrogen from the soil and, assisted by the carbon in the air, build up complex vegetable proteins, which being consumed by animals and broken down into simpler products again become the food of animals.

The power possessed by plants of building up complex organic compounds out of simpler chemical elements is the key to the claim made by vegetarians that plant foods alone are endowed with "vitality," while flesh foods are simply decaying devitalized tissue utterly useless for body-building purposes. Experience not only teaches that this argument is quite erroneous, but evidence is accumulating in favor of the existence in animals of a similar synthetic power.

The inorganic section consists of water and mineral salts, but practically the only one of the latter consumed as such is common salt (chloride of sodium), all the others being ingested in intimate association with the organic foods.

The organic nutrients are again divided into nitrogenous and non-nitrogenous, the proteins belonging to the former and fats and carbohydrates to the latter section.

Proteins.—(*a*) *Animal.*—The proteins are the best-known representatives of the nitrogenous class, and are composed of carbon, hydrogen, and oxygen, with nitrogen and sulphur. The first three elements are likewise the component parts of the fats and carbohydrates, so that proteins combine in themselves to a certain extent the properties of both classes of nutrients, and can to a certain extent replace them. It is, however, impossible for the fats and carbohydrates to replace or be built up into proteins, of which the protoplasm of both the plant and the animal cell is mainly composed.

There are many varieties of proteins, most of them being insoluble in water, but some, like the albumins of blood serum, egg, and milk, being quite soluble. One part of egg white and two parts water thoroughly shaken together make albumin water, an excellent food to administer to babies and others suffering from diarrhea. There are other proteins in blood and white of egg called globulins, which are only soluble in water with the aid of a neutral alkaline salt. Egg yolk again contains vitellin, while milk contains caseinogen, both of which are phospho-proteins. The flesh of most animals is composed of proteins, chiefly myosin, and these are associated with nucleo-proteins which on decomposition yield the notorious substance known as uric acid—in its way quite a harmless body if it only be expelled rapidly enough from the system. Being, however, rather insoluble, especially in acid fluids, it has a way of getting into positions where it is not wanted and thus creating trouble.

(*b*) *Vegetable.*—So far we have only mentioned animal proteins, but there is an infinite variety of vegetable proteins—twenty or thirty different kinds at least being known—and these are not quite so acceptable to the human body as animal proteins, because the latter undoubtedly correspond more closely to the proteins of which our own tissues are composed. Not only is this the case, but the vegetable proteins are usually inclosed in an indigestible envelope of cellulose, just as we have seen in the case of the gluten of wheat in the wholemeal bread, and until this has been ruptured they are unable to be digested and absorbed into the blood. They are therefore in large measure expelled in the feces quite unutilized, and it has been shown that in this way as much as forty-two per cent. of the nitrogen of the vegetarian's food is lost.

Proteins all agree in one particular, and that is, they undergo a curious transformation called coagulation in the presence of agents such as heat, alcohol, and astringents generally, like alum and tannin, and ferments such as rennet. The hardening of eggs, the clotting of blood, and the curdling of milk are familiar examples of this change.

Like all organic matter, proteins may be burned, and when this takes place in the air they are decomposed into carbonic acid gas, water, oxide of sulphur, and pure nitrogen, which passes off unchanged. A precisely similar process of oxidation—as it is

called because oxygen is absorbed from the air—takes place in the body, but the various stages of decomposition are by no means so simple, another process termed hydrolysis being invoked to assist matters. Hence the proteins are not so thoroughly burned up as in the air, so that they leave cinders or ash, which is apt to accumulate in the body under certain circumstances. Urea is the best known of these residual products of the disintegration of proteins, and it is excreted in the urine, but there are many other much more complex and usually poisonous compounds which make their appearance in the lower bowel and are apt to be reabsorbed into the body and so set up a form of self-poisoning termed auto-intoxication.

Fats.—In common with the carbohydrates, fats are composed of carbon, hydrogen, and oxygen, but in contradistinction to them contain more carbon and less oxygen, for which reason a given quantity of fat on burning will produce 2¼ times as much heat. In the human body and bodies of animals they are found in large quantities in bone marrow, adipose tissue, and milk, while in plants they are most commonly found in seeds, nuts, linseed, etc. Body fat is a mixture of three fats, stearine, palmitin, and olein, and on account of the low temperature at which the last-named becomes solid, the contents of the fat cells of the adipose tissue are fluid during life. Fats and oils are identical in composition, only differing in their melting-points. Fats are insoluble in water, although their component parts, namely, fatty acids and glycerine, are soluble. Hence in the body during digestion they are split up into these substances and so absorbed. Milk contains varying proportions of fat—cow's milk 3½ to 4 per cent., while whale's milk contains as much as 43 per cent., and this is an interesting illustration of adaptation when one remembers the heat-producing powers of fat.

Carbohydrates.—These substances are usually defined as compounds of carbon, hydrogen, and oxygen, in which the last two elements are in the same proportion as in water, and in the main this is so. They are essentially vegetable products—starch, cellulose, cane-sugar, grape-sugar or glucose, fruit-sugar (levulose or fructose) being typical examples. Two are found in the animal body, namely, milk-sugar, or lactose, and glycogen, or animal starch, the latter being present in the liver, muscle, white blood corpuscles, and other tissues. The more common forms

are divided into three classes—(1) the monosaccharoses: grape-sugar (glucose), fruit-sugar (levulose), and galactose; (2) the disaccharoses: cane-sugar (saccharose or sucrose), milk-sugar, and malt-sugar; (3) the polysaccharoses: starch, dextrine, glycogen, cellulose. It is interesting to note that before they can be utilized in the body as food they must each be converted into grape-sugar.

Sugars are all easily soluble in water, and for household purposes are mainly derived from the sugar-cane and the sugar-beet, in about equal proportions. It is a great mistake to look upon sugar as simply a condiment, as, although it is incapable of supporting life on account of its lack of nitrogen, it is a most important nutrient. It produces heat and energy in a much more economical and agreeable form than protein or fat. The food-fruits, apples, pears, grapes, bananas, owe their food value almost entirely to their content of sugar. The great value of sugar as an energy-producing food is now so well known that in the army while on the march a daily ration of four ounces is issued to each man. It is equally useful as a nutrient in the case of children, and in the winter time when given to the limits of a child's digestive capacity possesses heat-producing powers.

Sugar can also be obtained from the sap of the maple tree and from corn and other starches. Molasses is a by-product obtained in the refining of sugar, and syrups are obtained from the evaporation of the saccharine juices of plants. Honey is composed of from sixty to seventy-five per cent. of invert sugar (that is, derived from natural sugars by inversion) and water, and shares with milk the distinction of being the only dietetic agencies originally intended for this purpose and no other. It is much more easily digested than sugar.

When yeast is allowed to grow in a solution of sugar, alcohol and carbonic acid are produced, and this alcoholic fermentation is well illustrated in the manufacture of beer.

Starch is found in practically all plants, and is composed of a number of overlapping layers separated by cellulose. It is specially abundant in potatoes and cereals. It is insoluble in cold water, but when treated with boiling water the little starch grains swell up and rupture the cellulose envelopes. When heated in the dry state it is converted into dextrine (the common gum used for postage-stamps) and soluble carbohydrates.

Dextrine is formed in this way in the crust of bread and wherever potatoes or other starchy foods are browned.

Cellulose is the groundwork or skeleton of plants within which the cells are inclosed. It has the same chemical composition as starch, but except in young and tender plants it is quite indigestible, which therefore prevents its nutrient contents from becoming available as food, unless by heat or otherwise the cellulose envelope is ruptured.

Carbohydrates and fats are consumed by burning in the air or oxidation in the body, their end-products—when combustion is complete, as even in the body it usually is—being carbonic acid and water.

It is convenient to complete our review of the alimentary principles at this point, and for this purpose we make a short reference to the mineral matters and water.

Mineral Matters.—In a properly balanced dietary there is not the slightest necessity for the addition of any mineral salts to our diet, and except for the almost universal presence of the salt-cellar on our tables, we might remain in complete ignorance of their existence. Nevertheless, they are quite indispensable to the vital activities of the body, and animals from whose diet they have been purposely excluded quickly succumb. It is even of greater interest to know that the addition of inorganic mineral salts in correct proportions to a diet which has been exhausted of them is not sufficient to enable it to impart nourishing properties to the body. Mineral salts in the food must therefore exist in some organized form or vital association, and their deprivation even in small quantities is frequently followed by disease. It is now known, for example, that the peculiar malady so prevalent in the East and known as beriberi owes its inception to the use of polished rice as the staple article of diet, and the addition of the external coats which have been "polished" off the rice soon exterminates the disease. The lacking essential ingredient which is responsible for the outbreak of this disease is some organic compound of phosphorus, and it is worthy of note that while the addition of inorganic or even organic phosphates cannot stay the malady, substances like peas or beans, yeast, wheat bran, or rice meal, all of which contain this organic phosphorus in large proportions, at once cure the disease when present, or prevent its development.

To a mixed diet containing a fair quantity of animal food there is really no necessity to add any common salt at table, because animal food already contains an abundance of mineral matter. Nevertheless, most people consume more than half an ounce per day, and it is open to question whether in some cases it may not be extremely harmful to do so. In any case, those who are subject to catarrhal ailments of one kind or another, such as frequent colds in the head, would do well to keep their supplies of common salt within the most moderate limits. Despite this statement, there is no reason to believe that in the average case even a fairly large consumption of salt is attended with injurious results, and there is not the slightest evidence to show that it is in any way associated with the production of cancer, as has sometimes been asserted.

As the human body contains altogether about seven pounds of mineral matter, most of which is to be found in the bones, one is rather surprised to find that we only require about two thirds of an ounce of mineral matter daily, and apart from the addition of salt which is probably superfluous, the ordinary daily mixed diet is capable of supplying more than this quantity. Sodium, potassium, calcium, magnesium, iron, phosphorus, sulphur, chlorine, are the most essential mineral constituents of the food. Sodium is found chiefly in animal foods; potassium chiefly in vegetable foods,—potatoes being especially rich in it; calcium (lime) is especially abundant in milk, eggs, rice, and asparagus, and magnesium usually goes hand in hand with it; iron exists in fairly large proportions in spinach, yolk of egg, beef, and apples; while phosphorus and sulphur are common in most protein-containing foods, cheese, kidney-beans and mutton being notable for the quantity they contain.

Water.—The importance of water in the human economy is manifest when we realize that quite seventy per cent. of the weight of the body is made up of water.

Roughly speaking, about four and a half pints of water are excreted from the body daily; of this quantity about one half escapes by the kidneys, containing in solution urea, uric acid, and other waste matters from the breaking down of proteins; a little more than a quarter is excreted by the skin as sweat and sebaceous matter, containing some of the fats; a little less than a quarter by the lungs in the shape of watery vapor holding in

solution waste matters from the breakdown of the carbohydrates and fats; and the residue (about two per cent.) escapes by the bowels. In a vegetarian, however, as much as ten per cent. may be excreted by the bowels, creating a much more abundant and softer stool than in a mixed feeder.

It is important to note that more water is excreted than is ingested, because about ten or twelve ounces are actually manufactured from the tissue itself during the process of combustion. It is, however, manifest that the balance must be supplied in the food and fluids consumed, and about half of the whole weight of solid food consists of water. This would leave a little more than two pints to be supplied in an actual fluid form, and it is probably judicious to drink the equivalent of six glasses of fluid each day. A considerable quantity is consumed as tea and coffee or similar beverages, but the more one can take as pure water the better, because one of the chief functions it subserves is to carry off in solution waste products from the body, and pure water is the best solvent known to chemists. Fat people and those who are out of condition are able to accommodate as much as five pounds of useless water in the interstices of their tissues, and one of the objects of training is to rid the body safely of this excess of fluid. Where a large proportion of protein is consumed the tissues are relatively free from water, whereas the body tends to become richer in water when the fats and carbohydrates are in excess in the diet.

Where the digestion is not impaired, it is an advantage to partake of water or other bland fluid at meal-times, as a better distribution of nutrient material is thereby obtained. Many people who live in a city, however, find that they are apt to suffer from indigestion if fluid is abundantly supplied at meal-times, and this is doubtless due to the fact that the stomach has become atonic and cannot effectually expel the fluid. It should be noted that fluids are always expelled from the stomach before solids.

The best time to take fluid is first thing in the morning and last thing at night, and most people find that a glass of cold water in the morning immediately on rising and the same quantity of hot water at night just before retiring are valuable adjuncts to their diet, enabling them to obtain with comparative ease a daily evacuation of the bowels.

CHEMICAL COMPOSITION AND VALUE OF FOODS

Meats

FOOD	Protein percentage	Fat percentage	Ash percentage	Water percentage	Calories per ½ pound
Porterhouse steak	22.3	19.6	1.6	61.2	654
Sirloin steak	19.1	18.3	2.1	62.3	539
Tenderloin steak	17.5	25.6	.9	60.9	682
Ribs beef	16.4	23.2	1.3	54.9	676
Rump beef	17.9	22.8	1.6	62.9	669
Sweetbreads	15.3	11.8	2.2	81.2	414
Tongue	18.6	8.8	1.6	71.3	368
Round steak	28.2	7.4	2.3	65.0	431
Roast beef	26.2	15.3	1.9	61.1	565
Corned beef	14.7	27.4	5.4	54.9	668
Tripe	9.3	1.1	.4	89.1	141
Pickled tongue	13.2	21.9	5.3	64.1	563
Leg veal	21.2	6.9	1.4	73.2	346
Loin veal	20.9	11.2	1.2	70.4	374
Rump veal	21.2	17.1	.9	63.1	532
Leg lamb	19.2	23.1	1.1	59.2	669
Shoulder lamb	19.0	30.2	1.2	52.2	762
Lamb chops	21.9	30.4	1.6	48.1	849
Leg mutton	19.2	17.9	1.0	64.2	562
Shoulder mutton	18.3	22.4	.8	61.9	639
Pork chops	17.3	31.7	1.2	51.2	841
Ham	14.9	34.2	1.3	52.9	859
Pork tenderloin	19.2	12.8	1.0	68.3	462
Smoked ham	17.3	39.2	5.3	40.1	921
Pig's feet	17.1	13.9	1.4	69.4	462
Salt pork	2.2	8.7	4.5	9.6	1842
Smoked bacon	11.4	65.3	6.2	21.9	1413
Sausage	17.0	44.2	3.4	40.3	1061
Chicken	21.8	7.9	1.2	70.2	446
Capon	22.4	23.4	1.4	57.4	793
Duck	19.2	21.0	1.6	61.9	662
Goose	17.1	28.3	1.3	56.0	842
Pigeon	23.4	11.9	1.9	65.2	534
Squab	18.4	23.8	1.7	59.4	742
Turkey	23.1	18.0	1.4	58.0	710

CHEMICAL COMPOSITION AND VALUE OF FOODS

Dairy Products

FOOD	Protein percentage	Fat percentage	Carbohydrate percentage	Water percentage	Calories per ½ pound
Eggs, uncooked	13.1	10.3	.2	73.9	369
Boiled eggs	13.4	12.1	.2	73.6	382
Butter	.9	84.9	.1	11.2	1874
Buttermilk	2.7	.7	4.6	91.4	89
American cheese	28.7	35.7	.4	31.8	1033
Cottage cheese	20.7	1.1	4.2	72.1	262
Fromage de Brie	15.7	20.8	1.2	60.4	626
Cream cheese	25.7	33.5	2.6	34.2	1969
Limburger cheese	22.9	29.3	.6	42.3	849
Neuchâtel cheese	18.6	27.6	1.5	49.8	769
Roquefort cheese	22.4	29.3	1.6	29.5	870
Swiss cheese	27.4	24.7	1.5	31.6	1033
Cream	2.6	18.3	4.4	73.9	474
Kumiss	3.1	2.4	5.0	89.1	129
Condensed milk	9.7	9.4	11.3	68.0	396
Skimmed milk	3.5	.4	4.9	90.3	89
Whole milk	3.1	3.8	4.8	87.2	170
Whey	1.1	.4	5.2	92.8	70
Gelatine	91.3	.2	...	13.8	870
Calf's-foot jelly	4.1	...	17.5	77.9	211
Lard	...	100.0	...	...	2109
Oleomargarine	1.1	83.2	...	9.7	1769
Beef juice	4.7	.8	...	93.2	70
Chocolate	12.7	48.6	30.4	5.7	1342
Cocoa	21.4	28.7	37.8	4.8	1169
Coffee	.3	.2	1.3	98.0	18
Maple sugar	.5	2.0	83.0	5.0	730
Marmalade	.4	.2	84.6	14.7	746
Apple sauce	.3	.7	37.3	61.0	362
Stewed strawberries	.8	...	24.3	74.6	240
Citron	.4	1.7	78.3	19.2	760
Soups	4.2	.5	1.2	93.0	70
Clam chowder	1.7	.6	6.5	88.9	98
Bouillon	2.1	.2	.3	96.8	30
Consommé	2.1	.1	.5	96.2	42

CHEMICAL COMPOSITION AND VALUE OF FOODS

Farinaceous and Miscellaneous Foods

FOOD	Protein percentage	Fat percentage	Carbohydrate percentage	Water percentage	Calories per ½ pound
Barley flour	10.2	2.4	73.0	12.2	831
Buckwheat flour	6.6	1.3	78.4	14.0	820
Corn-meal	9.0	2.1	76.3	12.9	834
Oatmeal	16.4	7.6	69.0	7.6	932
Rolled oats	17.2	7.4	67.4	7.9	943
Rye flour	7.2	1.2	79.4	12.4	842
Wheat flour	8.2	1.6	77.0	14.0	821
Gluten flour	15.1	1.9	72.0	12.4	817
Graham flour	13.6	2.7	73.0	11.0	840
Farina	11.4	1.7	76.4	10.2	852
Macaroni	13.9	1.4	77.2	10.6	849
Shredded wheat	11.4	1.7	78.4	8.4	862
Spaghetti	12.3	.6	77.0	11.4	833
Noodles	11.4	1.0	76.3	10.9	830
Vermicelli	11.0	2.4	73.4	11.3	810
Zwieback	9.6	10.0	74.2	6.0	974
Soda-crackers	9.2	9.9	74.7	6.4	967
Sweet crackers	9.7	10.4	72.0	7.4	960
Pretzels	10.0	4.1	73.0	9.7	854
Cake	6.0	4.4	57.0	32.0	642
Cookies	7.1	9.4	74.0	8.2	952
Doughnuts	6.9	22.4	54.3	19.0	1014
Pie	4.3	8.9	33.0	66.0	742
Puddings	4.7	4.9	32.4	60.0	410
Molasses	2.7	..	70.2	27.0	640
Tapioca	.4	.2	88.2	11.3	842
Popcorn	10.5	5.2	78.5	4.5	942
Hominy	8.1	1.0	79.2	12.0	830
Rice	8.2	.5	78.9	6.1	826
Brown bread	5.2	2.0	47.0	43.8	504
Corn bread	8.1	4.5	46.5	39.0	514
Rye bread	8.9	.4	53.5	35.9	686
Buns	6.5	6.2	57.5	29.1	730
Rolls	8.3	2.2	55.9	32.2	646
Toasted bread	11.1	1.4	61.4	24.3	715
Honey	.6	.2	79.7	18.4	763

CHEMICAL COMPOSITION AND VALUE OF FOODS

Fish and Sea Food

FOOD	Protein percentage	Fat percentage	Ash percentage	Water percentage	Calories per ½ pound
Bass	19.9	1.9	1.5	77.0	247
Blackfish	18.5	1.4	1.2	79.1	210
Butterfish	18.2	10.3	1.4	70.0	422
Cod	17.1	.6	1.0	81.5	161
Eels	18.2	10.0	.9	70.9	370
Flounder	15.2	.9	1.4	83.0	147
Halibut	17.9	5.0	.9	76.2	282
Herring	20.4	7.8	1.9	70.1	335
Mackerel	17.9	6.9	1.4	74.0	340
Perch	20.1	4.2	1.3	74.4	270
Porgy	18.8	5.4	1.6	74.2	279
Salmon	21.0	13.1	1.0	65.0	390
Shad	18.3	9.4	1.2	71.1	369
Roe	21.5	4.0	1.6	72.9	289
Smelt	18.0	2.1	1.7	78.2	203
Trout	19.4	2.6	1.3	76.7	229
Weakfish	17.5	3.2	1.4	78.0	246
Whitefish	21.9	6.2	1.9	70.0	347
Salted cod	24.4	.6	23.0	52.0	201
Smoked herring	37.1	15.4	13.6	33.9	669
Salt mackerel	17.6	25.4	13.0	44.2	749
Canned salmon	20.8	12.7	2.5	64.0	464
Sardines	22.0	20.4	6.4	51.2	639
Sturgeon	32.2	20.0	4.9	39.4	748
Clams	9.2	1.2	3.0	86.0	132
Crabs	17.2	2.3	3.4	78.2	210
Lobster	17.0	1.9	.8	79.1	197
Mussels	9.2	1.4	2.1	85.2	146
Oysters	6.4	.9	4.2	87.0	121
Scallops	15.2	.9	3.8	81.0	174
Turtle	20.0	.7	1.3	80.2	192
Shrimp	26.0	1.1	.4	70.2	269
Bluefish	19.4	1.4	1.1	79.0	210
Pike	17.4	.9	1.4	82.2	138
Pickerel	19.2	.4	1.0	80.1	141

CHEMICAL COMPOSITION AND VALUE OF FOODS

Vegetables

FOOD	Protein percentage	Fat percentage	Carbohydrate percentage	Water percentage	Calories per ½ pound
Artichokes	2.9	.3	16.5	75.2	187
Asparagus	1.6	.1	3.5	94.2	57
Butter beans	9.2	.8	28.8	58.4	382
Lima beans	17.9	1.3	65.3	10.6	842
String beans	.9	1.0	2.1	95.1	49
Beets	2.1	.2	7.1	88.8	97
Cabbage	1.7	.4	5.8	91.3	69
Carrots	1.3	.3	9.5	88.3	115
Cauliflower	1.7	.6	4.6	92.1	76
Celery	1.3	.8	3.5	94.4	48
Corn	2.6	.9	19.5	76.0	249
Cucumbers	.7	.3	3.3	95.2	37
Eggplant	1.1	.4	5.3	92.5	69
Lentils	25.5	1.0	59.3	8.6	805
Lettuce	1.4	.2	2.6	95.0	47
Mushrooms	3.7	.5	6.9	87.8	130
Onions	1.7	.4	10.0	87.4	122
Parsnips	1.5	.6	13.6	82.8	166
Peas	24.4	1.1	61.8	9.7	829
Potatoes	2.4	.3	18.6	78.5	188
Potato chips	6.6	39.7	46.5	2.3	1342
Sweet potatoes	3.1	2.2	41.9	52.0	467
Pumpkins	.9	.2	5.3	93.2	66
Radishes	1.5	.2	5.9	91.6	72
Rhubarb	.8	.9	3.8	94.3	59
Sauerkraut	1.8	.7	3.6	88.9	48
Spinach	2.3	.5	3.4	92.1	57
Squash	1.6	.7	9.2	88.1	116
Tomatoes	1.1	.6	4.1	94.5	52
Turnips	1.5	.3	8.3	89.4	97
Baked beans	7.1	2.7	19.4	68.7	324
Tomato catsup	1.7	.4	12.5	82.5	27
Horseradish	1.7	.3	10.4	86.2	171
Olives	.9	20.5	8.3	42.5	519
Pickles	1.3	.6	4.2	93.6	64

CHEMICAL COMPOSITION AND VALUE OF FOODS

Fruits and Nuts

FOOD	Protein percentage	Fat percentage	Carbohydrate percentage	Water percentage	Calories per ½ pound
Apples	.5	.7	14.1	84.4	144
Apricots	1.3	...	13.6	85.2	149
Bananas	1.1	.5	22.1	75.6	237
Blackberries	1.2	.9	11.0	86.5	146
Cherries	.8	1.0	16.0	76.9	171
Cranberries	.3	.8	9.7	89.0	113
Currants	1.3	...	12.6	85.2	141
Figs	1.4	...	18.9	79.3	197
Grapes	.8	1.1	14.2	58.3	169
Huckleberries	.5	.7	16.5	82.0	176
Lemons	1.1	.9	8.6	89.4	115
Muskmelons	.8	...	9.5	89.1	99
Nectarines	.7	...	15.7	83.0	172
Oranges	.7	.3	11.7	86.7	127
Peaches	.6	.2	9.3	89.5	88
Pears	.5	.4	14.2	84.6	148
Pineapple	.5	.6	9.4	89.4	109
Plums	1.1	...	20.2	78.6	198
Pomegranates	1.6	1.4	19.7	76.9	224
Prunes	.7	...	18.8	79.4	188
Raspberries	.9	...	12.4	85.9	129
Strawberries	1.1	.7	7.6	90.6	99
Watermelons	.3	.3	6.6	92.6	77
Dates	2.0	2.7	78.6	15.6	820
Prunes, stewed	2.0	...	73.2	22.1	720
Raisins	2.5	3.5	76.2	14.8	799
Almonds	21.1	55.0	17.2	4.7	1580
Brazil-nuts	16.9	66.7	7.1	5.5	1678
Butternuts	27.8	61.0	3.4	4.6	1646
Chestnuts	6.1	5.3	42.0	45.2	589
Cocoanuts	5.6	50.5	27.8	14.3	1387
Hickory-nuts	15.3	67.5	11.5	3.9	1672
Peanuts	25.9	38.4	24.3	9.3	1280
Pecans	10.8	71.0	13.4	3.2	1789
Pistachios	22.1	53.8	16.5	4.4	1490
Walnuts	18.2	64.2	12.8	2.7	1662

How Much Protein is Required.—This is one of the most difficult and contentious problems in the whole range of dietetics. One authority maintains that a person requires at least 125 grams (about 4 ounces), while another authority insists that not more than half of this amount, or about 60 grams, is ever required by anyone. The explanation of this serious difference is simple enough, for it is found that nitrogen equilibrium may be maintained on very variable quantities of protein. From the remarks that we have already made it will be apparent that the problem is complicated by the fact that proteins can be utilized in the body both as building material and fuel substance. We must therefore decide whether it is feasible, and if so healthy and legitimate, to reduce the supply of protein to the exact amount required for repair purposes, relying entirely on the carbohydrates and fats for providing heat and work, or use the protein for the double purpose.

Voit insists that a full supply of protein is essential to a full measure of health and strength, to maintain a powerful opposition to the incidence of disease, a vigorous digestion, and to impart such stimulation to the system as betokens the possession of vital energy.

Chittenden, on the other hand, argues that no protein can be stored in the tissues, that excess of protein propagates toxines which gain access to the circulation and poison the body, that energy is lost in excreting the surplus protein, that disease is eradicated and the body rendered much healthier on a low supply of protein.

The truth apparently lies midway between the views of the two protagonists, as a careful analysis of the average diet-list will determine, but I am personally convinced that the amount of protein necessary is certainly an individual question which is settled for each by a little experience and reflection. Any person who never takes less than one gram of protein per kilogram of his body weight, i.e., for a man weighing one hundred and forty pounds about two ounces of protein, is not likely to go far wrong so long as he eats a sufficiency of carbohydrates and fat to supplement it. This is, however, a most important point, as within limits the greater the quantity of fat and carbohydrate supplied along with the protein the less is the latter used for supplying heat and work, and the more therefore is available for

tissue-building purposes. This is what is meant when it is stated that fats and carbohydrates are "protein sparers," and the ideal condition would be to find the exact quantity which would allow the body to use all the nitrogen in protein for purposes of tissue repair.

On the above basis the full amount of protein requisite for a day's allowance would be equal to $60 \times 4.1 = 246$ calories, and would be found in 12 ounces of beef, 10 ounces of lamb, 8 ounces of mutton, 35 oysters, 12 ounces of salmon—none of which contain much in the way of fat and no carbohydrate at all; 10 ounces of almonds, 3½ pints of milk, 6 ounces of pine kernels, 10 eggs, 8 ounces of cheese—all of which contain either carbohydrates or fats and some of them both.

On the other hand, those who accept the higher standard of 125 grams (over 4 ounces) of protein, would require to eat 20 eggs, or about 5 platefuls of cooked meat (20 ounces), in order to assure their day's allowance of protein. Doubtless the man who takes from 80 to 90 grams (about 3 ounces) of protein daily, will not sustain any damage thereby and is certain to be amply catered for.

The Requisite Quantity of Fat and Carbohydrate.—It may be inferred from what has been said that this will depend on the amount of protein consumed. If we allow 80 grams, or 328 calories, of protein and agree that 2700 calories are required daily, that would leave roughly 2370 calories to be supplied by non-nitrogenous food. So far as the tissues are concerned it would not matter whether we decide to select these either from fat or carbohydrate, but there is a limit to the digestive capacity for the former and indeed for the latter. It is largely, however, a matter of temperament and nationality, the Esquimaux depending largely upon fat and the Hindoos on carbohydrate. There should be little difficulty in the digestion of 100 grams of fat per day, and that would be contained in 5 ounces of butter, and represent 930 calories, leaving 1470 to be provided by carbohydrate. About 14 ounces of sugar, or 370 calories, would fulfil the daily demands of the system for carbohydrate.

Milk: a Complete Food.—Appropriate food combinations have been attained by experience, and each nation and even district has its own list which fulfils all the nutritive requirements of the body. It will always be found that articles rich in car-

bohydrate or fat are combined with those containing large quantities of protein—bread and cheese, bread and omelette, bacon and beans, potatoes and beef, or cheese or even milk, being all well known examples. Few people, however, will stop to think that none of these substances except milk was ever actually intended by Nature as a food and for no other object, and hence it comes that milk is practically the only food which contains all the alimentary principles in anything like the normal proportions. It is indeed the only substance which has any pretensions to be called a complete food, serving as the sole natural nutrient for many months in early life, and many adults have been known to subsist on it alone for years at a time and remain in abounding health and vigor.

Cow's milk is most frequently used, and contains in round figures 87 per cent. of water, 4 per cent. of protein, 4 per cent. of fats, 4.5 per cent. of sugar, and .5 per cent. of mineral matter. This last ingredient is of great importance, containing as it does a large proportion of phosphates and lime and a small proportion of iron.

Its chief defects are its liability to be contaminated with disease germs and its rather serious constipating qualities. Boiling the milk, which kills the disease germs, only seems to increase the constipating effect, but this can be counteracted to a certain extent by eating wholemeal bread with it. A lunch of 10 ounces of such bread with a pint of skim milk contains one third of the nutriment required for the whole day, and this compares favorably with a restaurant lunch costing a great deal more.

If mixed with equal quantities of cream it is an excellent natural cure for "acid" stomach, or heartburn, which is such a troublesome ailment for those who work in offices.

For those who are "run down" or suffering from nervous exhaustion nothing can equal the restorative qualities of a glass of hot milk three times a day in addition to the ordinary meals.

Whey is prepared by adding two teaspoonfuls of rennet to one pint and a half of milk heated to 104° F., carefully but thoroughly breaking up the clot which forms, and straining through muslin. It possesses few nutritive properties, and is chiefly used as an agreeable drink, although a whey cure consisting of nothing but whey, fruit, and vegetables is much in vogue for those who have lived too freely.

Cream, butter, buttermilk, "soured" or curdled milk, kumiss (fermented mare's milk), are all derived from milk.

Cheese perhaps is its most important product, however, and those who find it difficult to digest may either eat it with zwieback after being carefully grated, or try the following excellent preparation. Chop or grate a quarter of a pound of cheese, dissolve a saltspoonful of bicarbonate of potash in a little water, place in a stew-pan and gently heat. The cheese will soon dissolve, and may be eaten in this form, or half a pint of milk and a couple of eggs added, carefully stirring all the time. Eaten with zwieback, oatmeal cake, or wholemeal bread, the body will easily be supplied with all the alimentary principles in ample proportions.

Another favorite way of preparing cheese is with macaroni as in the well known *macaroni au gratin.* Soak one ounce of macaroni overnight in cold water until required, then pour off the water. Grate four ounces of cheese. Place a layer of grated cheese in the bottom of a well buttered pie-dish, a little pepper, then a layer of macaroni, and so on alternately, having a layer of cheese on the top. Place in the oven for a few minutes to brown. This, eaten with toast, constitutes a complete food.

Eggs.—Eggs are among the most important articles of a mixed diet. An egg is an undeveloped chick, and therefore its constituents are practically those which will build up the living body. The shell consists chiefly of carbonate of lime, the white is almost a pure solution of protein, the yolk, besides protein, contains a large proportion of fat and several highly important substances for building up the nervous system. Among them are two very important minerals—phosphorus and iron—both in organic combination. Seven and a half eggs will supply for one day all the iron which the human body requires. Yolk of egg, therefore, is an extremely useful food for anemic persons.

An egg contains a good deal more nutriment than the same weight of meat, but in different proportions. Despite this, however, an egg is not a complete food, because it contains no carbohydrate material. For this reason eggs ought to be added to rice or other cereals, and in this way a pudding becomes a complete food; in the same way, bread and butter eaten with eggs constitutes a complete food. When kept, eggs gradually lose a certain amount of their water and become lighter. A fresh egg

should sink at once in a solution of two ounces of salt to a pint of water, but the longer it has been kept, the nearer the surface it will be found. Eggs are easily digested, but it is a mistake to imagine that raw eggs are more easily digested than lightly boiled eggs. Two of the latter should leave the stomach in less than two hours. Fifteen to twenty eggs are equal in value to two pounds of medium fat meat.

Vegetables.—The average American cook appears to have absolutely no conception of the method of cooking vegetables; the ordinary method of soaking them in water and boiling them for a longer or shorter period, then discarding the water and serving up the mass of fibrous tissue which is left, is simply a means of wasting the only valuable part of the vegetable.

Most people have a very fair idea that the valuable ingredient of all vegetable matter is the mineral salts which it contains. Until quite recently the rôle played by these mineral salts was by no means well understood. It is now known, however, that a deficiency of mineral matter may produce the most serious disease. A century ago, when sailing-vessels were largely used as a means of communication with other countries, scurvy was a very well known disease. It was known to be produced by eating salt meat, and it could be easily prevented by a daily supply of fresh vegetables. As these, however, were not forthcoming on a long voyage, lemon juice containing valuable salts of potash in a very active form was substituted, and even to-day, in most countries, no ship is permitted to travel without a large supply of this substance. Another disease which is very common among sailors in the East, who subsist largely upon rice, is called beriberi. It is due entirely to eating rice from which the husk has been removed, this extra coating of the rice grain containing a kind of phosphorus which is of immense value in the human economy. It has been established by experimental feeding of fowls with the same dry polished rice that a similar disease can be originated in them, and this can be quite easily cured by the addition of yeast, or indeed by adding the husks which have been discarded in the polishing of the rice.

These and many other facts well known to scientific men are evidence that the mineral salts contained in organic form in living vital association with vegetable material are of infinitely more value than those to be found on the druggists' shelves.

Now boiling these vegetables dissolves out all those mineral salts, and the mess which is left is simply an inducement to indigestion. Hence to conserve those valuable mineral salts, vegetables should always be steamed, and as this is by no means an easy process for the ordinary cook, a special vessel consisting of one pan within another is utilized for preparing vegetables for the table. In lieu of these processes, ordinary vegetable soup is of immense value, containing as it does all the vital mineral salts so essential for the growth and repair of the body. Probably few people know that spinach is a much more valuable source of iron even than Blaud's pills, and it is a great pity that an agreeable method of preparation of this substance for the table should not be in vogue. Next to spinach the yolk of egg contains more iron than any other food known.

Fruits.—These consist chiefly of water agreeably flavored. They may be divided into the food fruits and the flavor fruits, the former consisting of figs, dates, prunes, raisins. Dried figs are more nourishing than an equal weight of bread, and six ounces with a pint of milk make a satisfying meal. Milk and dates, half a pint of the one and half a pound of the other, constitute another alternative meal.

Nuts.—Nuts can hardly be overrated as articles of diet, though doubtless this statement will appear strange to the individual who eats a few after his dinner and supper and in all probability suffers from severe indigestion therefrom. Nevertheless, it is true that bulk for bulk they contain a greater amount of nutriment than any other food substance we know.

Almonds are among the most acceptable members of the class, and contain a highly digestible fat which constitutes 53 per cent. of the total weight of the nut; 21 per cent. of a protein much more soluble in the digestive fluids than the gluten of wheat, and which is also capable of dissolving or helping in the solution of the fat; and in addition about 10 per cent. of carbohydrate with mineral matter. From them can be prepared the most delicious butter of a highly nourishing character, and which by the addition of a little water can be made into a very efficient substitute for milk. Their great objection—and this they share with most nuts—is their large content of cellulose, which is of a particularly dense and unyielding character. For this reason, when using them as a food, either the most careful mastication

must be practised—and this is not always possible for adults—or else the nut must be passed through a nut mill and so prepared for consumption.

Flesh Foods.—It is convenient to apply this description to all those substances usually included under the definition animal food, although strictly speaking the latter term likewise embraces eggs, milk and its products, gelatine, beef teas, beef juices, and beef extracts. Flesh foods are still the most favored articles of diet for supplying the body with building material or protein, and herein lies a great danger, because on account of their attractive character there is a tendency to consume considerably more than is required for the purpose of nutrition.

BEAUTY CULTURE

INTRODUCTION

ONE of our great philosophers has said, "A healthy body is the tabernacle, but a sickly one the prison of the soul." In the same way we may say that perfect health is the necessary foundation for all culture of physical beauty, for there are few physical attributes which can withstand the ravages caused by sickness. Homely features cannot be improved upon, it is true; but a bright, clear, healthy complexion goes a long way toward minimizing their defects. On the other hand, the pleasing effect of features which are classically perfect can be altogether marred by the sallow complexion and unsightly skin blemishes which chronic indigestion, dyspepsia, and other ills invariably bring in their train. We cannot add or take away one inch from our stature, but the well knit, supple frame of perfect health does a great deal to atone for excess or lack of inches. Thus, we can take comfort in the knowledge that the secret of the most enduring type of physical beauty lies first and foremost in the preservation of the health by a rigid adherence to the simple laws of hygiene. If we are to keep well we must have clean surroundings, rational living, including plenty of exercise, and abundance of fresh air, pure food and water, a suitably regulated diet, and sensible clothing.

In considering, therefore, the remedies for a bad complexion, skin blemishes, wrinkles, obesity, undue thinness, and other deterrents to beauty, we shall consider first and foremost the natural remedies, giving also some useful hints in regard to simple and harmless cosmetics as aids to beauty.

Perhaps nowhere are defects of hygiene more plainly featured than in the skin and complexion. Sedentary habits reveal themselves in the sallow and unhealthy looking skins of those who have not realized that perfect cleanliness internally and exter-

nally is necessary in order to keep the skin and complexion pure. Sedentary habits are not conducive to internal cleanliness. Those who take little or no exercise, who eat too much and too often, whose diet is unsuitable, cannot be surprised if the eliminating organs of the body fail to do their duty. Indigestion, constipation, and other stomach troubles prove the most relentless foes the complexion can have. It should therefore be the aim of all who value their personal appearance to prevent these ills as far as is in their power.

A glass of hot water sipped slowly the last thing at night, and a glass of cold water with a little lemon juice taken the first thing in the morning, has been proved by some people to be an unfailing preventive of constipation. Others have found the necessary remedy in a glass of hot water taken half an hour before each meal. It is a fact that people who suffer habitually from constipation seldom take enough water. An apple or a wineglassful of orange juice taken half an hour before breakfast acts upon the liver and forms an excellent tonic. It is a good plan also to always have some stewed fruit upon the table at breakfast-time. Begin the meal with some of this fruit.

Never hurry over any meal. The bread-winners of a family are very apt to literally "bolt" their breakfast in order to catch the train or car which is to take them to their place of business. Needless to say, it is much better to rise half an hour earlier and to take the full time over the morning meal, than to allow oneself just sufficient margin to snatch a hasty breakfast.

The importance of strict attention to diet cannot be too highly estimated. Curries, highly spiced food, pickles, etc., should be taken in strict moderation, or in many cases avoided altogether. Needless to say, nothing has a more coarsening effect upon the skin than overindulgence in any kind of stimulants. Excessive tea and coffee drinking is also harmful.

Faulty teeth are at the root of most digestive troubles. Never defer too long a necessary visit to the dentist, for a single decayed tooth in the mouth works a good deal of mischief. Where the teeth are bad it is impossible to masticate the food properly, and when the food is not properly masticated it cannot be digested.

It seems hardly necessary to emphasize the fact that to keep the skin healthy personal cleanliness is essential. There is no

more effective skin tonic than the daily tub, while a brisk rub-down with the towel afterward stimulates the pores of the skin to healthy action. Many people make a fetish of the cold bath, but its merits are apt to be overrated. Cold bathing may suit young, vigorous people, but as a general rule those verging toward middle life will do well to leave it alone. Most people, therefore, must content themselves with the bracing effect obtained by thoroughly sponging the body with cold water after a warm bath has been taken. It is most unwise of parents to force their children to take cold baths in the hope of making them hardy. Where cold bathing agrees with people it proves stimulating. For purposes of cleanliness, however, the warm bath is all-essential.

CARE OF THE COMPLEXION

How to Massage the Face.—It is important to remember that all movements in face massage should be very gentle, and they should also be of a rotary motion, beginning from the eyes and carrying it to the hair lines. The same operation can also be applied to the forehead, using the tips of the fingers, as shown in Illustration No. 1 (following page 608). With the tips of the two middle fingers massage the lines from the corners of the lips up to the nose.

Place the first and second fingers of each hand so that they meet in the center of the chin, and from this point massage outward, following the contour of the face. Then, beginning at each side of the mouth, rub the skin food into the cheeks gently but firmly with the palms of the hands with a brisk upward circular movement. This prevents the formation of lines at the corners of the mouth, serving also to fill out any hollows in the cheeks. The massage movements should be followed by a very gentle tapping of the cheeks with the tips of the fingers, as shown in Illustration No. 2 (following page 608). Great care should be taken in massaging around the corners of the eyes, as the skin here is very elastic, and rough movements would do a great deal more harm than good. Massage very gently under the eyes from the nose and upward to the temples. Rub upward across any horizontal lines upon the forehead, then across the tiny vertical lines (the result very often of too much frowning) which are apt to form between the brows. Finally, massage

from the base of the nostrils along each side of the nose upward. From five to ten minutes should be spent upon the massaging operations. Use no more of the skin food than the skin can comfortably absorb, and afterward wipe off any superfluous skin food with a soft towel.

Apply a good cold cream to the face; let it remain for ten or fifteen minutes, then wipe it off; after which the face should be washed with lukewarm water and a good quality of soap. Dry thoroughly by gentle rubbing. Do not rub hard, as hard rubbing loosens the skin and causes wrinkles. After the skin is dry, massage with a good cream, made up of these ingredients:

℞ Spermaceti one-half ounce
Cocoa-butter one-half ounce
Oil of Sweet Almonds two and one-half ounces
White Wax four drams

The skin food used for massaging the face should be the purest obtainable; it should be free from all animal fat, for this induces the growth of superfluous hair.

When the skin is naturally dry, use the following formula:

℞ Oil of Sweet Almonds two ounces
Spermaceti two ounces
White Wax six drams
Rose-water three drams

Mix.

Directions: The cream should be thoroughly rubbed into the skin for several minutes; then use a soft cloth to take off what remains.

When red blotches appear on the skin, it is an indication that the blood needs cooling off. Five or six glasses of buttermilk should be taken each day. For external treatment, the following is recommended:

℞ Barley-meal three ounces
Liquid Honey one and one-half ounces
Whites of two eggs.

Mix.

Directions: This should be applied to the skin every night, after the skin has been cleansed with cold cream, tepid water, and a good soap.

Spread it smoothly with the tips of the fingers upon the nose, cheeks, and forehead, and let it remain all night; in the morning, wash it off with a solution of ten drops of benzoin to a quart of warm water.

For those contemplating a trip or a day's outing, the following advice, if carried out, will be a great help in preserving the beauty of the skin from the sun's rays. Before starting on the journey, bathe the face with lukewarm water and almond-meal; then apply a light coat of cold cream, rubbing it in thoroughly; wipe the face gently with a soft cloth and dust the face with talcum.

Massaging the Neck and Shoulders.—Massage is also beneficial for eradicating the lines which form upon the neck, although where there is a tendency to double chin the massage movements should be carried out without the skin food. Rub very gently across the horizontal lines and round the throat with an upward stroke toward the ears, as shown in Illustration No. 8 (following page 608), afterward gently tapping the flesh under the chin with the fingers, as shown in Illustration No. 3.

The old and wrinkled-looking necks which are often seen on quite young people are more often than not the result of wearing high and tight collars. Too much muffling of the throat with furs during the winter is also harmful. The throat should be kept as free as possible, in order that the muscles of the neck shall have full play. When wearing furs, always add some lemon juice to the washing water, as this removes discoloration from the neck. After washing, sponge well with cold water, both at night and in the morning.

Preventing Double Chin.—The following simple exercise, if persisted in regularly, will strengthen the muscles of the neck and prevent the formation of a double chin. Crane the neck, stretching the chin forward as far as it will go, then bend the head slowly backward until it almost touches the shoulders at the back, then bring it slowly forward again until the chin touches the chest. Repeat several times; then, with the chin well raised, turn the neck slowly first to the right until the face is looking over the right shoulder, and then to the left. In very obstinate cases of double chin the wearing of a bandage at night is often beneficial, as shown in Illustration No. 5 (following page 608).

Making Up.—It is not advisable, except it be in the most necessary instance, that recourse should be had to artificial means as an aid to beauty. In such cases, however, great care should be taken that the make-up is so well applied as to baffle detection of the most observing.

Powder.—A good face-powder is a harmless and even beneficial cosmetic. If used in moderation, powder is not counted as a "make-up," and most women would feel completely lost without their powder-puffs. Great care must be taken, however, that the powder is not used to excess and is not allowed to choke up the pores of the skin. Where powder is used, the use of an emollient at night to cleanse the pores is more than ever necessary. Rub a little greaseless cream into the skin before applying the powder. Let it remain on for a few minutes, then gently wipe it off with a soft towel, and dust the powder gently over the face. A good powder carefully used forms a protection for the skin against sunburn and the nipping effect of cold winds.

A good powder can be made from the following formula:

℞ Finely powdered Orris-root one dram
Precipitated Chalk two drams
Venetian Talcum four drams
Mix.
Directions: Use as a face-powder.

Cheap powders should be avoided, for they contain ingredients, such as mercury, which are harmful to the skin. A box of powder judiciously used lasts a long time. Liquid powders are used chiefly as preventives of sunburn. Great care and discrimination should be exercised in selecting a powder in this form, and it should only be purchased from a reliable beauty specialist whose name forms a sufficient guarantee as to its purity.

Rouge.—Rouge should be applied very sparingly, after the application of a little face-cream, which is lightly rubbed off with a fine linen rag before applying the color to the face. Rouge is obtainable in the form of both paste and powder. Only the smallest portion should be applied if detection is to be escaped. Always make up in a good light, and dust the face well over with powder after applying the rouge. It is a curious fact that those who have the foundation or the remnants of a

good complexion to build upon are always those who can make up the most effectively. Their skins somehow seem to take to the color, which looks quite natural. It is chiefly when used upon sallow, dead-looking skins that, unless exceptional care is exercised in applying it, make-up seems to betray itself to all observers. Great discrimination should therefore be exercised in the selection of rouge, and in applying it be careful to make it just as deep or as light as the natural complexion will permit.

Constant use of powder and paint on the face renders it absolutely necessary to cleanse the skin thoroughly both night and morning.

All make-up should be removed with the aid of a good face-cream, and regular massage should be practised. In many cases a steam face-bath will be found necessary at least once a week, to thoroughly open the pores of the skin.

Steaming the Face.—Fill a basin with hot water softened with lemon juice. Wring out a towel dipped in the basin, and apply to the face, as shown in Illustration No. 6 (following page 608). A few minutes of this is sufficient to open the pores. Then wash the face with warm water and soap, rinsing in water to which a few drops of benzoin have been added.

Blackheads, Skin Roughness, Sunburn, and Other Blemishes.—The best preventive of blackheads is a liberal use of good soap and hot water. Pure Castile soap should be used at the night toilet. It should be well washed off after using, for nothing is so bad for the skin as to allow the soap to dry into the pores. The following lotion will be found an effective remedy:

℞ Precipitate of Sulphur one teaspoonful
Tincture of Camphor one teaspoonful
Glycerine one teaspoonful
Rose-water eight tablespoonfuls
Mix well.
Directions: Apply after washing.

Blackheads may also be removed by a special instrument made for that purpose, called a blackhead extractor, as shown in Illustration No. 7 (following page 608). After removal the place should immediately be swabbed with absorbent cotton dipped in a solution of peroxide of hydrogen, as shown in Illustration No. 10.

A mole on the face may be removed by the application of a caustic pencil, as shown by Illustration No. 9.

A little good skin food rubbed gently into the skin at night after washing will often prevent any tendency to roughness from cold winter winds, sunburn, etc. Face massage is also very beneficial. When coming in from a walk on a hot summer day, rub a little face-cream into the skin, allowing it to remain there for about ten minutes, then wash off with soft water. Never wash the face at once upon coming in: this rule applies to winter as well as to summer.

Wrinkles.—These are caused by impoverishment of the subcutaneous tissues of the skin. They are landmarks of time which few can avoid, but with due precautions their advent may be considerably retarded. Unfortunately in these modern days of hurry and worry, premature wrinkles are becoming more and more the rule, and quite young people show the vexing little criss-cross lines between the brows and at the corners of the nose and mouth. These may be eradicated by applying a piece of adhesive tape, as shown in Illustration No. 14 (following page 608). The causes of premature wrinkles are many and varied, the most prolific being overwork, nervous strain, and worry. The cure consists in the first instance of removing the cause. It is a curious thing that really great worries do not bring in their train anything like the crop of wrinkles which are induced by the tendency to worry over trifles displayed by so many people nowadays. This tendency must be cured if the wrinkles are to be avoided. Try to cultivate pleasant thoughts, make an effort to control the mind in such a manner as to check once for all the undue tendency to worry. This brings us back once more to the fundamental question of health. Ill health, a sluggish liver, the general sense of feeling below par, are very often responsible for an irritable, fractious disposition. See first, therefore, to the health of the body, and an easy and contented mind will in most cases follow.

Then there are the wrinkles which come from overwork and too much burning of the midnight oil. For these there is no more certain remedy than that afforded by a few weeks' change of air and absolute rest with plenty of good wholesome food.

Superfluous Hair.—The hair which appears on the face of women is the result of many different causes. The most common

cause is the use of improper creams for massaging the skin. Many skin foods contain animal fats which stimulate the roots of the hair. Women who have ovarian troubles usually show an extra growth of hair on the body. The hair is not of the stiff type found on man, but soft and curly.

Superfluous hair may be removed by electricity or by the use of drugs. By the first method the root of the hair is killed; by the second method the drugs burn the hair at the edge of the skin. If the growth of hair is noticed early, the use of pure Castile soap and warm water, without creams or massages, will check the growth to some extent.

The following prescription will remove superfluous hair and can be widely recommended:

℞ Barium Sulphide two drams
Zinc Oxide two drams
Powdered Starch two drams
Mix.
Directions: Apply to the hairy part of the face.

This powder should be moistened with water and a thin coat applied over the bearded region of the face. After three to five minutes this is washed off with water and a thin coating of boric vaseline applied to the face and left on for several hours. Of course this is only a temporary removal, as the hair will grow again.

Another method for removing superfluous hair, and which can be easily done at home, is by pulling the hair out with the small tweezers made especially for this purpose, as shown in Illustration No. 11 (following page 608). The first time this is done it might not prove entirely satisfactory, but after two or three treatments the hair will most likely not make its appearance again, providing, however, the general health is good, and the condition does not arise from other sources as mentioned above.

Flushing, Red Nose.—Indigestion, and, in the case of women, unsuitable clothing and tight lacing are the most prolific causes of these ills. Happily few women tight-lace nowadays; but those who go about in the dead of winter in what are too aptly termed "pneumonia blouses," transparent silk stockings, and thin shoes cannot complain if they pay the penalty in the flaming color of their nasal organ. The clothing should be light and loose yet

sufficiently warm, while too much emphasis cannot be laid upon the necessity for adequate shoe-leather. On very cold days either good strong-soled shoes should be worn or sensible shoes with the additional protection of warm gaiters. It is an important point to remember that if the feet and the ankles are kept warm, healthy circulation of the blood throughout the body is promoted. Nowadays, when the heating of the houses in winter has reached the level of a fine art, light dresses, stockings, and shoes can well be worn indoors during the very depth of winter, but —and this is important—they should be worn indoors only. Out of doors one's clothes should afford adequate protection against the inclemency of the weather.

Tight-fitting collars, which press unduly upon the muscles of the neck, impeding the circulation, also cause flushing of the cheeks and nose, but their harmful effects do not end there, for they serve to destroy the beauty of the neck by causing either double chin or the formation of unsightly lines which are very difficult to eradicate.

CARE OF THE HAIR

Brushing.—Good brisk brushing of the hair for at least eight minutes night and morning is essential to keep it clean and in good condition. Great experts on the care of the hair declare that half the trouble in regard to falling hair, dandruff, etc., arises in the first instance from the want of cleanliness. Too frequent washing is harmful, as it serves to dry up the natural oil. There is no set rule as to just how often the hair should be washed. In towns, where there are factories and dust continually in the air, the hair requires washing oftener than in the country. Greasy hair requires washing more frequently than dry hair, in order to keep it in good condition. Where the hair is abnormally greasy, it is seldom healthy and requires greater attention. A hair specialist should be consulted, and a cleansing lotion should be applied once or twice a week as he prescribes, and this will obviate the necessity of too frequent washing.

The scalp must be kept perfectly clean, and it has been proved that Castile soap is the best to use for the purpose. A little borax may be added to the water.

The following formula is an excellent tonic for greasy hair; it will also strengthen its growth besides taking out the greasiness:

℞ Tincture of Cantharides one dram
Tincture of Capsicum one dram
Spirits of Rosemary four ounces
Mix.
Directions: Massage into the scalp every other night with the tips of the fingers.

When the hair is very dry, a good oily preparation should be rubbed into the scalp before the hair is washed. Never use soda in washing the hair. Use soft water and a good lather of white Castile or other good quality of soap. The yolks of two eggs well beaten up, rubbed into the scalp, washed off with warm soft water, make an excellent shampoo.

Falling Hair.—Where the falling out of the hair is excessive, it is generally due to ill health. Before trying external remedies, therefore, the health should be attended to and a physician consulted. The following tonics are also recommended to prevent the hair from falling out:

℞ Tincture of Cantharides one-half dram
Rose-water one and one-half ounces
Aromatic Vinegar six drams
Spirits of Rosemary six drams

Or:

℞ Whisky two ounces
Oil of Sweet Almonds one ounce
Aqua Ammonia one ounce
Alcohol eight ounces
Gum Camphor one dram

Or:

℞ Rose-water five ounces
Cologne one ounce
Bay Rum one ounce
Glycerine one-half ounce
Fluidextract of Jaborandi one-quarter ounce

Gray Hair.—There is no cure for the gray hair of advancing years, for as old age creeps upon us its coloring-matter gets used

up. No man or woman, however, should commence to have gray hair, if their scalps are healthy, before the age of fifty. Premature grayness can be arrested, but it must be taken in time. In most cases the general health requires attention. Dark hair, as a rule, turns gray quicker than fair hair, while dry hair loses its color much sooner than hair which has a liberal supply of natural oil. There are many preparations on the market to-day which claim to have the properties in them to arrest premature grayness, but these should not be tried without the advice of good authority on the subject.

The following is a well known remedy for grayness and can be used without injuring the hair:

℞ Henna Leaves one and one-half ounces
Henna Powder one and one-half ounces
Boiling water three pints

Put the henna leaves in an earthen jar and pour on the boiling water; let it stand for ten or twelve hours. Strain through a muslin cloth and place on the fire until it comes to the boiling-point; then add the henna powder. This should be applied to the hair once or twice a day. During this treatment the following prescription should be made up and rubbed into the scalp:

℞ Resorcin one dram
Betanaphthol one dram
Alcohol four ounces
Mix.
Directions: Apply to the scalp once a day.

The following prescription is a very simple, well known remedy, and has proved successful in preventing hair from turning gray:

℞ Sulphur one ounce
Bay Rum four ounces
Mix.
Directions: Apply to the scalp once a day.

Dyeing and Bleaching the Hair.—This should never be attempted by an amateur. If the hair must be dyed, let it be done in the first instance by a hair-dresser well recommended, who can



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ILLUSTRATION No. 1

MASSAGING THE FOREHEAD

See page 599



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ILLUSTRATION No. 2

MASSAGING THE FACE

See page 599



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ILLUSTRATION No. 3

MASSAGE FOR REMOVING DOUBLE CHIN

See page 601



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ILLUSTRATION No. 4

MASSAGING THE SHOULDERS



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ILLUSTRATION No. 5

BANDAGE FOR PREVENTING DOUBLE CHIN

See page 601



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ILLUSTRATION No. 6

STEAMING THE FACE

See page 603



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ILLUSTRATION No. 7

REMOVING BLACKHEADS

See page 603



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ILLUSTRATION No. 8

MASSAGE FOR REMOVING DOUBLE CHIN

See page 601



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ILLUSTRATION No. 9

REMOVING A MOLE WITH CAUSTIC PENCIL

See page 604



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ILLUSTRATION No. 10

APPLYING ANTISEPTIC AFTER REMOVING BLACKHEADS

See page 603



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ILLUSTRATION No. 11

REMOVING SUPERFLUOUS HAIR

See page 605



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ILLUSTRATION No. 12

A DRY SHAMPOO



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ILLUSTRATION No. 13

ADMINISTERING EYE-DROPS

See page 609



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ILLUSTRATION No. 14

REMOVING WRINKLES BY ADHESIVE TAPE

See page 604



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ILLUSTRATION No. 15

MASSAGING THE EYEBROWS

See page 610



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ILLUSTRATION No. 16

BRUSHING THE EYEBROWS

See page 610



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ILLUSTRATION No. 17

MANICURING THE NAILS



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ILLUSTRATION No. 18

USE DENTAL FLOSS INSTEAD OF TOOTHPICKS

See page 615



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ILLUSTRATION No. 19

CLEANING THE TEETH WITH PUMICE POWDER

See page 615



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ILLUSTRATION No. 20

BRUSHING THE TEETH

See page 615

also give a supply of the preparation when the dye has to be renewed. Most weird effects have been obtained by some people who have used peroxide of hydrogen and other bleaching and dyeing preparations when ignorant of their true ingredients and how they should be used. There are many harmless and inexpensive dyes on the market which are effective and satisfactory to a certain degree. Elderly people would do well to think twice before dyeing their hair. In their case, dyed hair seems to emphasize the lines upon the face, and to give a greater appearance of age than if the hair had been allowed to grow gray gracefully. In cases of premature grayness, which has been allowed to go beyond cure, however, the hair may be stained with very good results.

CARE OF THE EYES, EYEBROWS, AND EYELASHES

Bright eyes form not the least valuable gift of perfect health. All undue straining of the eyes, such as reading or working in an indifferent light, should be avoided. It is harmful also to sit facing artificial light when reading at night. Sit with the back to the light so that the latter is thrown on the pages of the book or paper and does not glare straight into the eyes.

A wineglassful of orange juice taken in the morning will help to make the eyes bright. Many people declare that this effect can also be obtained by eating orange peel.

The eyes should be bathed daily with the following lotion, using an eye-dropper as shown in Illustration No. 13 (following page 608):

℞ Witch-hazel one ounce
Boiled water (cold) one ounce
Mix.

Or:

℞ Salt one grain
Sulphate of Zinc one grain
Rose-water eight ounces
Boiled water (cold) eight ounces
Mix.

Directions: Apply with an eye-cup or an eye-dropper.

Cold in the eyes can be quickly remedied by using:

℞ Formaline two drops
Boiled water (cold) one teacupful
Mix.
Directions: Apply with an eye-dropper.

After severe eye-strain, the use of a little boracic powder dissolved in water, and applied with the aid of an eye-cup, affords an excellent tonic. In some cases, bathing the eyes with cold tea gives relief.

Massaging and brushing the eyebrows, as shown in Illustrations Nos. 15 and 16 (following page 608), will render them shapely and improve their condition. Vaseline or cocoa-butter rubbed into the eyebrows and eyelashes at night will promote their growth. Apply the cocoa-butter to the eyelids on the end of a match around which a piece of absorbent cotton has been twisted. Apply under the lashes, curving them outward; this will induce them to curl at the ends. The eyelashes should never be clipped in an effort to make them grow.

Staining the Eyebrows and Eyelashes.—Very light eyebrows and eyelashes are apt to give the face an insipid look. The constant application of vaseline or cocoa-butter at night tends to make them darker. If this is not sufficient, "water cosmétique" provides a simple, natural-looking, and harmless stain. It can be had in various shades, and must be applied very sparingly with an eyebrow brush.

The Care of the Hands.—Well kept hands are a sign of refinement which all should endeavor to cultivate. Men and women alike should be particular in this respect. It is not at all effeminate for a man to have well kept, well trimmed, and well shaped nails, though many seem to think so.

The skin of the hands requires equally as much treatment as does the skin of the face. The following formula should be applied to the hands on retiring every night:

℞ Almond-oil one ounce
Spermaceti six drams
Cucumber Juice six drams
White Wax one dram
Oil of Neroli four drops
Mix thoroughly, and keep for constant use.

Whitening the Hands and Arms.—After washing at night-time rub with glycerine and rose-water or red lavender. Mix in the proportion of two parts of glycerine to one part of either rose-water or red lavender. Chamois leather gloves at least three sizes too large should be worn at night. With some people, in spite of all treatment, the hands remain stubbornly red. This is usually caused by defective circulation. Attention should be paid to the general health. Even those whose hands show no undue tendency to redness should make a practice of rubbing some emollient into the skin at night, as this has a most softening effect.

Care of the Fingers and Nails.—The nails and fingers, like the teeth, if well cared for, give a woman a touch of refinement without which no woman can be beautiful.

The nails should receive constant and regular attention if they are to show the well kept appearance and half-moons at the base which add so greatly to their beauty. Some sort of manicure outfit, however simple, should be procured. With a package of orange-sticks, a pair of curved nail-scissors, a nail-file, some emery-boards, a nail-polisher, a supply of nail polish, and some good cuticle cream wonders can be achieved. A little of the cuticle cream should be applied by means of an orange-stick to the base and sides of the nails every night after washing the hands. This softens the cuticle, so that it can be well pushed back without any danger of formation of hangnail. After washing the hands always push back the skin at the base and sides of the nails with a rough towel. It is as well, also, to file the nails daily to avoid the necessity of too frequent cutting. Then when necessary apply the nail polish and polish them. This is sufficient for the daily care of the nails, but to keep them in perfect condition they should be manicured at least once a week according to the following directions.

After having first thoroughly washed the hands take some very hot water and soften it with the juice of half a lemon and make a lather with some good soap. Dip the tips of the nails into this lather of soap and water, which must be as hot as can be borne. Allow them to soak in this way for about five minutes, and the cuticle will become soft and ready for treatment.

The skin around the nails should be made to appear as if there were no connection or relation between them. When the nails

become brittle, they should be soaked twice a day for five minutes in olive-oil, or cold cream applied to them before retiring. Should they become soft and dull, the following preparation will be found very good:

℞ White Wax five grams
Nut Oil thirty grams
Resin ten grams
Alum two grams

The above should be melted on a slow fire; when cool, put in a pomade jar. This should be rubbed on the nails twice a day.

Half-moons.—To acquire perfect half-moons, the orange-stick must be used once a day, pressing back the cuticle. In doing this, care should be exercised that there is not too much pressure on the nail, as the cutis beneath is liable to be injured.

Take some cuticle cream (any kind of cold cream will do) on the end of the orange-stick and gently and firmly push back the skin at the base and sides of the nails. In most manicure sets is to be found a useful little implement called a cuticle knife; this should now be passed round under the skin at the base and sides of the nails to loosen any superfluous skin growth around the nail. The point of the orange-stick can be utilized in this same way. Now, with the curved scissors, trim the nails to as oval a shape as possible. After cutting the nails file them into shape with the file, and round off all roughness with the emery-board. Stains can be taken from the nails with peroxide of hydrogen, a very little of which should be applied on the end of an orange-stick round which a small piece of absorbent cotton has been twisted. This serves to make the nails beautifully white.

Next apply the polish and brush vigorously with the polisher. Then soak once more in hot water and, after drying, polish them again. Either paste, powder, or a special kind of liquid nail enamel can be used for polishing the nails.

The following preparation is a good polish:

℞ Boric Acid Powder three drams
Talcum Powder three drams
Pulverized Starch three drams
Tincture of Carmine fifteen drops
Mix thoroughly.

The following rouge is an excellent one for the nails:

℞ Fresh Lard two drams
Powdered Carmine one dram
Oil of Bergamot twenty-five drops

Rough Elbows.—Rejuvenate the coarse, scaly skin by plenty of friction with nail-brush. If the roughness is very bad rub salt into the elbows at night before washing, and after drying apply a little cold cream. Avoid constantly leaning the elbows upon desk or table.

CARE OF THE FEET

The feet should be kept perfectly clean, and if tender a little borax or salt added to the water used for bathing them is an excellent remedy. For sore, tired, aching feet, rub them with lemon juice before retiring.

For perspiring feet, the following powder gives satisfactory results:

℞ Tannin eighty grains
Lycopodium nine drams
Alum three drams

Add two teaspoonfuls of the above, well mixed, to six quarts of tepid water, and soak the feet for five or ten minutes every night before retiring.

The feet should be dusted twice a day with the following:

℞ Talcum Powder nine ounces
Starch two ounces
Borax two ounces
Powdered Alum one ounce
Salicylic Acid one-half ounce
Naphthol one ounce

Corns.—For removing corns, soak the feet for fifteen minutes in hot soap-suds to which have been added a few drops of benzoin; then gradually push the corn upward from the skin with a towel. Four or five such treatments should be sufficient to

loosen the ordinary corn. For the more obstinate, deep-seated corn, the following preparation is excellent:

℞ Collodion one and one-half ounces
Salicylic Acid two drams
Fluidextract of Cannabis
Indica one scruple
Mix.
Directions: Apply two or three times a day.

Ingrowing Nails.—Gently lift the corner of the nail and place a small piece of absorbent cotton beneath it, and cut the nail in the center if the toe is sore; the cotton may be saturated with peroxide and must be changed every day.

Shoes.—Shoes should not be worn around the house; instead, a pair of sandals or slippers should be worn, thus giving the muscles of the feet a chance to relax.

Bathing.—The ordinary daily bath is not sufficient for the feet. There is discharged from the soles of the feet a large amount of waste matter—in fact, twice as much as that discharged from the liver—and if the pores of the feet become clogged or hampered in any way, it endangers the general health. The soles of the feet should be given a thorough scrubbing every day with a good stiff brush and a good brand of soap.

CARE OF THE TEETH

The following rules are necessary if you would have beautiful teeth:

1st. Have them examined and cleaned by a good dentist at least once every four months.

2d. Clean them night and morning with a good powder.

3d. Brush them after each meal.

4th. Be careful as to your diet.

Any of the following preparations will be found excellent for cleaning the teeth:

℞ Precipitated Chalk four ounces
Powdered Myrrh two ounces
Powdered Borax two ounces
Powdered Orris-root one-quarter dram

Or:

℞ Precipitated Chalk two and one-half ounces
Pulverized Orris-root one and one-half ounces
Gum Camphor one-half ounce

Toothpicks should not be used to pick the teeth; dental floss should be used instead, as shown in Illustration No. 18 (following page 608).

Any of the following will be found admirable for a mouth-wash:

℞ Tincture of Orris-root four drams
Alcohol four fluid drams
Spirits of Roses four fluid drams

Or:

℞ Tannic Acid six drams
Oil of Wintergreen two scruples
Alcohol two ounces
Powdered Orris-root two ounces
Water two ounces

Another excellent way in which to clean the teeth, and which can be done about once a month, is in the manner as shown in Illustration No. 19. Twist a small piece of absorbent cotton around the end of an orange-stick and dip the cotton into some powdered pumice. Work this around the surface of the teeth a few times, then cleanse the teeth and mouth with warm water, using the brush, as shown in Illustration No. 20. This will remove the tartar or discoloration.

BATHS

It is a well known fact, even among the laity, that the skin has to perform its functions, the same as do the heart, lungs, liver, kidneys, etc. The skin discharges twice as much waste matter from the body as the lungs, so that one can see the necessity for keeping the pores of the skin open, and the best means of doing so is by proper bathing.

The duration of a bath should not exceed twenty minutes. A good brand of soap should be used, preferably Castile made from

spermaceti; in winter, a glycerine soap is best. The water for a warm bath should be between 85° and 95° F. If the skin is sensitive and has a tendency to skin eruptions, a half-pound of starch added to the water is of great benefit.

For people who perspire freely, a half-teacupful of ammonia added to the water is a good preventive.

Exercise just before bathing opens the pores of the skin, making it more susceptible to the water. A bath should not be taken for two hours after eating, or when one is very tired. The use of a brush is preferable to a sponge, as it has a tendency to open the pores.

If people would take more baths and less medicine, we would have a healthier lot of people and fewer doctors and druggists.

REDUCING FLESH

An abnormally stout person can never expect to be really robust in health. A good many men and women show a tendency to corpulence as they approach middle age. In some cases this tendency is hereditary, but if taken in time it can well be checked.

Any tendency to stoutness is aggravated by want of exercise and unsuitable diet. Five miles a day has been said to be the minimum walking exercise that should be taken daily by men and women if they wish to keep in good health; but it is doubtful if ten out of every hundred follow this wise precept. There are some who, by force of circumstances, are compelled to lead a more or less sedentary life. The effects of this should be counteracted as far as possible. It is a great temptation for the busy worker to lazy away his leisure hours in a comfortable arm-chair with an interesting book, but this temptation should be strenuously resisted. A game of golf or tennis, an hour's sculling, baseball, or football, will be found much more beneficial, and will help to keep down the weight. The athlete is seldom threatened with a tendency to stoutness, merely because the constant exercise he takes serves to keep him fit.

There are some, however, who through force of circumstances are unable to participate in games. These should make a point of devoting twenty minutes every day to the practising of some

suitable physical exercises. The following have been found efficacious in the cure of obesity:

(1) Inhale a deep breath and stretch the arms upward above the head; then exhale the breath and bend forward, but without bending the knees, until the tips of the fingers touch the floor. Repeat several times. Then, after stretching the arms upward, bend slowly backward as far as possible. The second exercise is valuable for its effect in strengthening the muscles of the neck and back.

(2) Lie down flat on your back on the floor with arms extended behind the head and the feet well together. Then gently raise the left leg as high as it will go, lower it slowly, then raise and lower the right leg in the same way. Repeat several times, then raise and lower both legs together.

Diet.—The diet of those threatened with obesity should be very carefully regulated. Most people eat either too much or too little, or else partake of totally unsuitable food. Men are apt to err in the first and last respects, while women eat too little, taking unsuitable food and spoiling their appetites by little "pickings" now and then between meals. Three meals a day are enough for the average person. A suitable but not a heavy meal should be taken in the middle of the day if the chief meal is to be at evening. The woman worker who contents herself with a bun and a glass of milk at lunch-time may feel assured that she is doing her best to increase her weight, aside from the fact that she is not obtaining sufficient nourishment. Moreover, buns and doughy foods are the worst things to be taken by those inclined to be plump. All starchy and sweet foods should be avoided. No sugar should be taken in tea or coffee. Bread should always be toasted, butter taken in moderation, and jams, marmalade, etc., altogether avoided, as should potatoes, pastry, cocoa, rice, macaroni, and candy of all kinds. Plenty of good fruit and fresh vegetables will be found beneficial. Ale, beer, and all red wines should be eliminated from the diet. Constipation and indigestion must be prevented at all costs.

One last word to those who dread obesity. Be as active and energetic as you can, never staying late in bed in the morning. Get up before seven o'clock if possible all the year round, and endeavor to keep regular hours.

BEAUTY HINTS

Don't forget that habits either mar or help beauty and that it is always the little things that combine to make the whole. Therefore if the little points and hints given in these pages are strongly carried out, there is no reason why your figure, form, and development cannot be greatly improved upon.

Don't eat too much, and especially not too many sweets.

Don't stand with the shoulders forward or the abdomen thrust out.

Don't open the eyes upon a bright light or read in a dim light.

Don't forget to visit your dentist once every three months.

Don't sit with one shoulder higher than the other.

Don't sleep in an ill ventilated room, or one crowded with draperies and rugs.

Don't allow yourself to become ill. Every illness detracts from your vitality and adds to premature age.

Don't think your hair only needs brushing. Your scalp also must be massaged.

Don't let your muscles grow flabby. Firm muscles give the appearance of youth.

Don't allow the skin to become dry. It is conducive to wrinkles.

Don't forget that the warm bath is soothing; the cold bath is invigorating.

Don't wear tight shoes, tight gloves, or tight corsets.

Don't go into the outer air directly after washing the face.

Don't forget that the reclining posture is a general help to strength and beauty.

Don't be afraid of rain and snow, as they are tonic to your skin.

Don't thrust the hips far backward as you walk, or stand with one hip higher than the other.

Don't allow your hands and feet to remain cold; or neglect to bathe your feet every night.

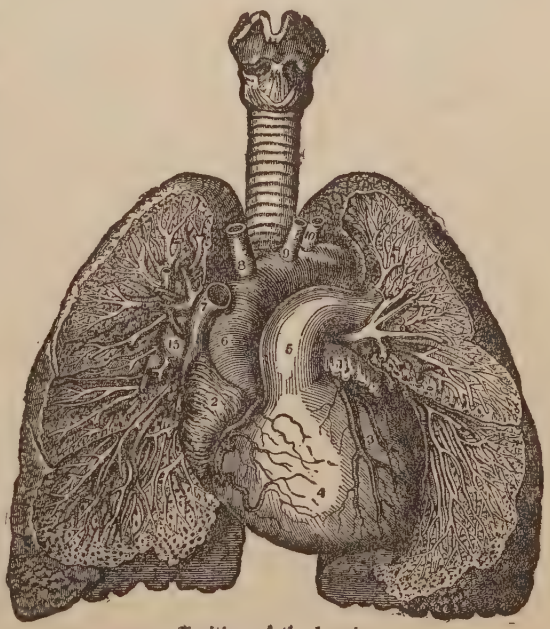
Don't forget that the eye-bath, mouth-bath, and nasal douche are daily tasks of cleanliness.

Don't neglect to protect your skin when you are going into the open air.

Don't forget that health is the basis of beauty; build your beauty upon that one foundation.

THE HEART

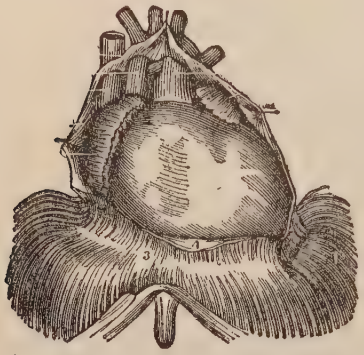
ANATOMY.—The heart is a hollow muscular pump with four cavities, each provided at its outlet with a valve, whose function is to maintain the circulation of the blood. The two upper cavities are known as auricles, from their resemblance to a dog's ears (*auricula,* a little ear), the two lower ones as ventricles (*ventriculus,* a little stomach). Owing to the fact that the heart has important connections with the nervous system, and that its action is liable to be increased or diminished by influences which powerfully affect the latter, the heart was regarded in olden times, and is still metaphorically spoken of, as the seat of the emotions.



Position of the heart.

Position.—The heart lies in the chest between the two lungs, but projecting more to the left side than to the right. On the left side its apex reaches out almost to the nipple, and lies beneath the fifth rib, while its right border extends only a short distance, at most an inch, beyond the margin of the breast-bone. Its lower border rests upon the diaphragm, by which it is separated from the liver and stomach, and this close connection has

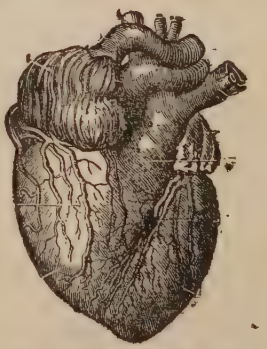
an important influence upon the heart in several disorders of the stomach. Above, the heart extends to the level of the second rib, where the great vessels, the aorta on the right side and the pulmonary artery on the left, lie behind the breast-bone.



An anterior view of the heart in its relative position as it rests on the diaphragm, the pericardium being divided and drawn back.

Shape and Size.—The heart of any individual was described by Laennec as, roughly, of the size and shape of the clenched fist. One end of the heart is pointed (apex), the other is broad (base), and is deeply cleft at the division between the two auricles. One groove running down the front and up the back shows the division between the two ventricles; a circular, deeper groove marks off the auricles above from the ventricles below. The capacity of each cavity is somewhere between three and six fluid ounces.

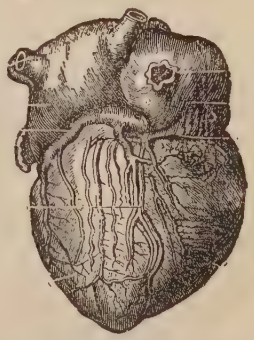
Structure.—The heart lies within a strong fibrous bag, known as the pericardium, and since the inner surface of this bag and the outer surface of the heart are both covered with a smooth, glistening membrane faced with flat cells and lubricated by a little serous fluid, the movements of the heart are accomplished almost without friction. The main thickness of the heart wall consists of bundles of muscle fibers, which run, some in circles right round the heart, others in loops, first round one cavity, then round the corresponding cavity of the other side. Within all the cavities is a smooth lining membrane continuous with that lining the vessels which open into the heart. The investing smooth membrane is known as "epicardium," the muscular substance as "myocardium," and the smooth lining membrane as "endocardium."



An anterior view of the heart in a vertical position, with its vessels injected.

A special band of muscle fibers, the "auriculo-ventricular bundle of His," runs from the right auricle down into the septum between the two ventricles; this provides the connection which times the ventricles to beat immediately after the auricles.

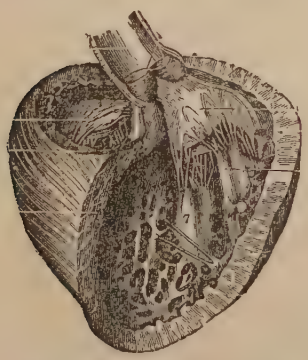
Openings.—There is no direct communication between the cavities on the right side and those on the left; but the right auricle opens into the right ventricle by a large circular opening, and similarly the left auricle into the left ventricle. Into the right auricle open two large veins, the superior and inferior venæ cavæ, with some smaller veins from the wall of the heart itself, and into the left auricle open two pulmonary veins from each lung. One opening leads out of each ventricle, to the aorta in the case of the left ventricle, to the pulmonary artery from the right.



A posterior view of the heart in a vertical position, with its vessels injected.

Prior to birth there is an opening (*foramen ovale*) from the right into the left auricle through which the blood passes; but when the child first draws air into its lungs this opening closes and is represented in the adult only by a depression (*fossa ovalis*).

Valves.—As stated above, there are four valves. Two of these are placed at the openings leading from auricle into ventricle, the tricuspid valve on the right side, the mitral valve on the left, so as completely to prevent blood from running back into the auricle when the ventricle contracts. Two more, the pulmonary valve and the aortic valve, are placed at the entrance to these arteries, and prevent regurgitation into the ventricles of blood which has been driven from them into the arteries. The noises made by these valves in closing are known as the "heart sounds," and can be heard by anyone who applies his ear to the front of a person's chest. "Murmurs" heard accompanying these sounds indicate defects in the valves, and form one of the chief signs of heart disease.



A three-quarter view of the left ventricle, after the removal of its anterior wall.

Action.—At each heart-beat the two auricles contract and expel their contents into the ventricles, which at the same time they stimulate to contract together, so that the blood is driven into the arteries, to be returned again to the auricles after

having completed a circuit in about fifteen seconds through the body or lungs as the case may be. The heart beats from sixty to ninety times a minute, the rate in any given healthy person being about four times that of the respirations. The heart is to some extent regulated by a nerve center in the medulla, closely connected with those centers which govern the lungs and stomach, and nerve fibers pass to it in the "vagus" nerve. By some of these fibers its rate and force can be diminished, by others increased, according to the needs of the various organs of the body. If this nerve center be injured or poisoned, for example by want of fresh air, by prussic acid, etc., the heart stops beating in human beings, though in some of the lower animals—i.e., frogs, fishes and reptiles—the heart may under favorable conditions go on beating for hours even after its entire removal from the body.

HEART DISEASES

Heart diseases belong to that class of diseases which can be recognized only by the trained observer, though their presence may occasion severe symptoms and evident signs of general illness perceptible to everyone. Their treatment, and a true appreciation of their slightness or gravity, belongs still more to the department of the specialist.

Varieties.—Many general diseases affect the heart; but, considering the arduous work which this organ constantly performs, and the fact that it never rests completely from the time of its formation till death ensues, it is subject to wonderfully few disorders. Its diseases are classified according to the part of the heart affected, or the nature of the changes produced. *Inflammatory affections* are divided into pericarditis, myocarditis, and endocarditis, according as the pericardium or enveloping membrane, the myocardium or muscular substance, and the endocardium or lining membrane are affected. *Valvular diseases* form one of the most important groups, there being eight diseases in this class, since each of the four valves may be "stenosed," i.e., its opening narrowed, or may be "incompetent," allowing some blood to flow through the opening in the wrong direction. *Hypertrophy*, in which the heart is enlarged and its wall thickened, and *dilatation*, in which one or more of

the cavities are dilated, form another group often associated with the valvular diseases. *Degeneration* of the muscular tissue, producing enfeeblement of the heart's action, may take place, either in the direction of a "fatty" or, more rarely, of a fibroid change. Finally, there is a class of *functional changes* in which—without apparent diseased change in the structure of the heart—palpitation, irregularity, rapidity, slowness, or even severe attacks of pain appear.

Causes.—A great variety of factors enter into the production of heart disorders; but, as already stated, the number of cases in which the heart is seriously affected is small considering the prime importance of the organ to life. The male sex, on account of the greater strain of daily life, is supposed to be much more subject to heart affections than the female sex, but this is not borne out by the statistics of deaths. An employment that necessitates constant and excessive physical strains, however, produces hypertrophy of the heart, which in later life tends to degeneration. Heredity plays an important though vague and indirect part in the production of cardiac disorders, for in persons suffering from heart disease it is often found that a parent or other near relative has been similarly troubled. Diseases of other organs which impair the quality of the blood, or throw a constant mechanical strain upon the heart, lead finally to degeneration of the latter, Bright's disease, various lung diseases, and anemia being specially potent in this direction. An irregular life in youth, particularly as regards indulgence in alcohol, is apt, in more advanced years, to result in similar degeneration. All the acute, febrile diseases produce temporary weakness of the heart, and acute rheumatism and scarlatina are particularly liable to be followed by permanent changes in the valves. Chorea has an effect similar to that of the two last named.

General Symptoms.—The heart possesses a remarkable power, known as "compensation," by which it adapts itself to new conditions. Thus, if a person takes up some more arduous employment than usual, the heart beats more powerfully and becomes larger, in order to overtake the extra strain; and, in a similar way, disease in one part of the organ, such as a valve, may be so compensated that not only do no symptoms arise, but the person may pass through a long life without suspecting the

existence of any such defect. It is a common mistake to suppose that disease of the heart ends always in sudden death, for only disease of the aortic valve and degeneration of the heart-muscle are associated with this accident, which even in these conditions is infrequent. If, however, the defect be so great that it cannot be remedied by "compensation," or if general ill health or the debility of age comes on, the pumping power of the heart weakens, and symptoms appear, some of which are referable to the organs in which the circulation is defective, others, like pain and palpitation, to the heart itself. For example, breathlessness and lividity are due to bad circulation in the lungs; faintness and giddiness to want of blood in the brain; dyspepsia, swelling of the abdomen, and dropsy of the feet, to backward pressure in the veins of the lower part of the body.

PERICARDITIS

Definition.—This is an inflammation of the membrane covering the exterior of the heart. It may be "dry," in which case the two opposing surfaces of the membrane are covered by a layer of fibrine worked up by the movements of the heart into ridges, very like those upon the surface of two slices of bread and butter forcibly separated from one another; or "effusion" may accompany this condition, when the pericardial bag becomes much distended by fluid. The causes of the condition are much the same as those of the following condition of endocarditis. In the majority of cases it arises in connection with an attack of rheumatic fever; and so long as it remains of the dry type, it occasions only slight feverishness and pain felt over the heart, and is seldom dangerous to life, unless accompanied by endocarditis. Poisoned wounds, consumption, scarlatina, diphtheria, pneumonia, and Bright's disease are also, though much less frequently, causes. Pericarditis, with effusion, generally follows the dry form unless the latter be very slight in extent, and the amount of fluid effused round the heart may reach as much as two quarts. The fibrine upon the surface of the membrane increases with the amount of fluid, and may form a coating like thick leather round the heart, which very greatly embarrasses its action. Pain over the heart, high fever, rapid and feeble pulse, restlessness, difficulty in breathing, and even delirium,

mark the presence of this serious condition. Recovery very often takes place, but the heart is apt to be left weak and dilated, in consequence of permanent roughening and adhesions between the two surfaces of the pericardium, and, in long-standing cases, this resistance to its action produces great increase in the size of the heart.

Treatment.—Treatment is usually effected either by the application of an ice-bag, or of blisters to the front of the chest, while various stimulants are given to maintain the action of the heart. Occasionally it becomes necessary to tap the pericardial cavity, and draw off some of the fluid which is embarrassing the heart's action.

℞ Aspirin five-grain tablets
DOSE: One tablet three times a day with plenty of water.

Or:

℞ Sodium Salicylate four teaspoonfuls
Peppermint-water three ounces
Mix.
DOSE: One teaspoonful in a wineglass of water every three hours.

ENDOCARDITIS

Definition.—This is an inflammatory condition of the membrane lining the heart, and, since the part most subjected to friction and strain is that covering the valves, so these valves are the most commonly affected parts, those on the left side of the heart being affected much more frequently than those on the right side. The inflammatory process consists in the appearance of small groups of nodules upon the valves. These unite to form wart-like growths, upon which fibrine is deposited from the blood to form pendants, often of some length. The condition just described is known as simple endocarditis, and occurs most commonly in connection with chorea in childhood and with rheumatic fever. Tonsilitis and scarlatina may also be complicated by simple endocarditis, and weakening diseases like phthisis, diabetes, Bright's disease, and gout may also produce it. Another form, known as ulcerative or malignant endocarditis, arises from diphtheria, pneumonia, puerperal fever, and other diseases of a septic nature, and is of much more serious import than the simple type, since fragments of the ulcerating valves

may be carried, by the blood-stream, all over the body, and set up abscesses in different organs, this form, indeed, resulting almost always in death. Simple endocarditis arises especially in those cases of chorea and rheumatic fever which are not allowed to rest during the attack, and though the endocarditis may give no symptom of its presence, it may leave the heart with serious valvular disease. Osler states that in half his cases of chorea, valvular disease developed subsequently to the attack of chorea. Palpitation and a slight increase of temperature form often the only warning of the onset of endocarditis during an attack of rheumatic fever. Little can be done for the condition beyond especial rest, quiet, and the application of an ice-bag over the region of the heart.

MYOCARDITIS

Definition.—Inflammation of the muscular wall of the heart.

Causes.—Myocarditis results from the same causes as acute endocarditis and is usually associated with it or with pericarditis.

Symptoms.—Often the symptoms of other diseases lead one astray from this disease and are masked by them. Weakness of the pulse out of the normal proportion with extreme rapidity is perhaps the most reliable sign. Dyspnea, pallor, and palpitation are also important manifestations. In some cases which occur with pyemia, puerperal, scarlet, and other fevers, pus is present and forms abscesses.

Treatment.—The treatment is the same as for acute endocarditis, which consists of strengthening the heart by stimulating it. Hot applications, hot baths, or heated irons applied to the extremities, and cold applications directly over the heart region, give relief. A general supporting and nourishing diet should be strictly followed. Stimulants like the following are the most effective:

℞ Aromatic Spirits of Ammonia one ounce
Dose: One-half teaspoonful in water every three hours.

Or:

℞ Strychnine Sulphate Tablets each ⅟₆₀ grain
Dose: One tablet after meals.

VALVULAR DISEASES

Valvular diseases form the most frequent and most important group of heart disorders. Although, in consequence of the power of compensation already mentioned, the heart may become more powerful and so neutralize the ill effects of a narrowed or leaking valve, it is not possible to predict how far this change will be affected by ill health or the strain of a laborious life, and, consequently, the detection of valvular disease unfits a person for entrance upon any public service, and renders him subject, if he becomes a candidate for life insurance, either to refusal or to a heavily increased premium. By far the most common cause of valvular disease is endocarditis, which, instead of passing off with the disease that produced it, has become chronic, leading ultimately either to thickening and contraction of the valves, so that they become unable to close their respective openings, or to adhesion of the segments of the valves to one another at their margins, so that the opening is very much narrowed. The former condition is known as incompetence, the latter as stenosis, and the two are found either separately or together affecting the same valve, in which case the condition is doubly serious. Osler quotes statistics which show that the valves on the left side of the heart are more frequently affected than those on the right side, in the proportion of about 18 to 1.

Aortic Disease.—Of all the valvular defects, incompetence of the aortic valve is the most serious, and next to it in importance comes stenosis of the mitral opening. Aortic incompetence leads to great dilatation and hypertrophy of the heart, which, in well marked cases, becomes so large as to receive the name of the "cor bovinum," or "ox-heart." Although aortic disease in young persons follows upon endocarditis, and may produce a rapidly fatal issue, on the other hand it may give rise to few symptoms directly referable to the heart, though persons who grow up with the defect generally remain more or less stunted in body, and feeble or capricious in mind and temper. Stenosis at the aortic valve is much rarer than incompetence, but when present it leads even more markedly to feeble development of body and mind. In elderly men aortic incompetence may arise as the result of constant overstrain from an athletic or laborious

life, combined with alcoholic indulgence, which together produce a degenerative change at the root of the aorta. This type often, though without much justice, goes by the name of "athlete's heart." Angina pectoris is not infrequently associated with the latter type, in consequence of the spread of the degenerative process to the coronary arteries which supply the muscle of the heart itself with blood. In either type, when compensation begins to fail, headache, giddiness, faintness on rising quickly, and dull pain about the heart appear. Later, shortness of breath, inability to lie down, and dropsy of the feet and legs appear, and there may be some spitting of blood. As stated above, sudden death may occur in a case of aortic incompetence, but death may also come on gradually, ushered in by increasing dropsy, great difficulty of breathing, and mental dullness.

Mitral Disease is of two types. In one case, the valve itself is at fault, owing almost always to endocarditis, which produces incompetence or stenosis, or both. In the other, the left ventricle is dilated so that the two segments of the valve are held apart by their attachments to its walls, and consequently a state of temporary incompetence is produced. It is of great importance to recognize this distinction, because, while the former is permanent and organic, the latter, which is due to the weakness of acute fevers, the strain of a single athletic effort, like a race, the debility of anemia, etc., may end in complete recovery, and is therefore said to be merely functional. In defects of this valve, the symptoms relate chiefly to the lungs, breathlessness on exertion being one of the most common, and the lips and ears becoming of a bluish tint, in consequence of the slow passage of blood through the lungs. Bronchitis and spitting of blood are very common, particularly in cases where stenosis is present. When compensation is failing, these symptoms become more marked, the liver and stomach get congested, producing a jaundiced tint of the skin, together with dyspepsia, and congestion of the kidneys may become dangerous to life. One of the most unpleasant symptoms is the "sleep-start," which catches the person as he is dropping off to sleep, making him start up gasping, and feeling as if his heart were stopping. All these symptoms pass off under treatment, to be renewed again and again at periods when the health is low. When the valve is stenosed, there is a tendency to the formation of small clots in the auricle; these may

be carried away and lodged in various organs, in the brain causing apoplexy. Sudden death in mitral disease is rare.

Disease of the valves on the right side is rare. The tricuspid valve may be incompetent in consequence of far advanced mitral disease, which increases the backward blood-pressure through the lungs upon the tricuspid valve. Stenosis of the pulmonary valve sometimes forms a congenital condition in children, who do not often survive early life.

Treatment of Valvular Diseases.—When a valve defect is accidentally discovered, even though it be perfectly compensated and give rise to no symptoms, it is well that the person should take certain precautions in his daily life, and he should therefore, unless of a peculiarly nervous and highly strung temperament, be informed by his medical adviser of the condition found in his heart. The subject of such disease must lead a quiet and well regulated life, avoiding, as far as may be, excitement, worry, and sudden strains, though methodical attention to business and even hard, steady work are quite well borne. The question of marriage is an important one, and, speaking generally, it is unwise for the subjects of aortic disease to marry. In mitral disease marriage is not attended with the same risk, although in a woman the condition of a heart with defective mitral valve becomes progressively worse with each confinement. The use of tobacco, prolonged hot baths, and excursions up mountains are, without question, bad for all cases of valvular disease. A simple, wholesome diet is necessary, and stimulants should not be taken so long as compensation remains good.

When compensation begins to fail—and frequently this does not take place till the approach of old age—the symptoms already mentioned appear, but, in early stages, rest may be the only remedy required. Various stimulants and tonics for the heart exist, those chiefly used being:

℞ Extract of Digitalis one-fifth-grain capsules
Dose: One capsule after each meal.

Or:

℞ Strychnine Sulphate Tablet Triturates ...1/60 grain
Dose: One tablet after each meal.

Many persons, by taking one of these drugs periodically and living a carefully regulated life, manage to keep in abeyance

all the symptoms of a serious valve-defect, and to live a busy, useful life. Congestion of the liver, lungs, and kidneys is treated by purgation, cupping, or even blood-letting, according to circumstances. For dropsy, tapping of the legs, abdomen, or chest has often to be practised. For breathlessness, the patient must often remain in the sitting posture night and day, and it is very important that a comfortable bed-rest should be provided. Pain about the heart is not very common, but, when it occurs, is relieved by careful attention to the diet, so as to prevent dyspepsia, and by doses of the following:

℞ Potassium Iodide one-half ounce
Water one fluid ounce
Essence of Peppermint three fluid ounces
Mix.
Dose: One-half teaspoonful in water after meals.

Spitting of blood, when it occurs, is not very copious, and is rather salutary than otherwise, so that it does not call for treatment. Sleeplessness is often a very distressing symptom of aortic disease, and seems to be most frequently relieved by a teaspoonful of compound spirits of ether or of paraldehyde.

ENLARGEMENT OF THE HEART

Enlargement of the heart is of two types, dilatation of the cavities with hypertrophy of the walls, and dilatation with thinning of the walls. The first takes place as the result of simple, constant strain, as in professional runners and other athletes; or as the change which follows the backward blood-pressure from a diseased valve, and which results in compensation of the valvular disease; or, finally, in consequence of high blood-pressure produced by Bright's disease. To this extent, and while general health lasts, hypertrophy is an altogether good thing, the only sign of its presence being a large heart with an extra-powerful beat. But there is in the later years of life a special tendency for the muscle of these hypertrophied hearts to degenerate; and further, if the vessels throughout the body be weak, as in Bright's disease, the powerful beating of the heart may tear them, particularly in the brain, with apoplexy as a result. Dilatation of the heart, with thinning of its walls, is always a bad thing, leading to feeble action of the organ. It occurs also

as the result of strain when the heart has not sufficient reserve force to hypertrophy, as often happens when persons not in training run a hard race. It takes place, too, in persons who are bloodless and subjected to overhard work, and it very often occurs to a slight extent after a severe fever. Sometimes it occurs suddenly, the heart becomes unable to contract upon the blood which accumulates in it, and death results in a few minutes or hours, in consequence of an extraordinary athletic effort by a feeble person, or in consequence of injudicious exercise too soon during convalescence from a fever.

Treatment is much the same as for valvular heart disease where compensation is failing. For a dilated heart rest combined with regulated exercise is the great cure. At certain spas and watering-places, these exercises have been brought to great *finesse*. Patients are made to ascend a succession of increasing heights daily, and thus bring on more powerful contraction of the heart.

DEGENERATION OF THE HEART

Degeneration of the heart occurs principally in elderly people, the most common form being a change of the muscle fibers, in scattered patches, into fat. In another form of degeneration, a deposition of fibrous tissue gradually takes place between the muscle fibers, which at the same time waste away. Less common forms of degeneration consist in a granular change in the fibers, producing great softening in the course of some fatal fevers; and a condition known as "brown atrophy," in which the heart muscle wastes as old age advances, and becomes largely changed into brown pigment.

Fatty Degeneration.—In stout people, a deposit of fat takes place upon the heart (fatty infiltration), interfering with its action and causing shortness of breath upon slight exertion, but this is not nearly so serious as true degeneration, in which the change involves a gradual destruction of the actual muscle. Fatty degeneration arises as a senile change, most commonly in persons addicted to alcohol, in whom it may appear early in middle life; and also as a sequence to hypertrophy of the heart. In general devitalizing diseases like pernicious anemia, or when the coronary arteries, which supply the heart itself with blood, are narrowed by disease, fatty degeneration of the heart muscle

is common. It may come on acutely in infective diseases like pneumonia or influenza, and is one of the most frequent causes of death in these fevers. If it comes on gradually, it causes attacks of pain in the left side of the chest and left arm, with great irregularity and palpitation of the heart on exertion. Unusual torpor after breakfast on very slight exertion is said to be also a sign of its presence. Other symptoms are occasional fainting fits and great loss of mental activity, and there is a special danger of sudden death in persons affected by this degenerative process.

Fibroid Degeneration of the muscular wall of the heart is usually a result of gradual and very complete blocking in the coronary arteries due to patches of atheromatous thickening in their walls. The muscle fibers waste or die in patches as a result of defective nourishment, and dilatation of the cavities, clotting of the blood on the fibroid patches, followed, it may be, by sudden death, takes place. This condition of the heart is usually associated with advanced disease in the kidneys. The symptoms are much the same as those due to fatty degeneration. In the treatment, the same drugs are used as for valvular disease, though more sparingly; and as to diet, sugary and starchy foods should be especially avoided. The person should beware of any excessive mental or physical strain.

FUNCTIONAL AFFECTIONS

Palpitation is a condition in which the heart beats fast and the person becomes conscious of its beating; angina pectoris is one in which extreme pain and a sense of impending death are due to spasm of the heart. Many troublesome irregularities of the heart are now known to be caused by defective action of the muscular connections. The site of these defects can be analyzed by means of elaborate modern instruments. Of these the chief are the *polygraph,* an instrument by which tracings from the pulsations of the heart and various vessels can be recorded together on a moving strip of paper, and compared; and the *electrocardiograph,* which by means of a galvanometer registers photographically the electrical changes that take place in the body as the heart beats.

The heart muscle has in itself, independently of nervous con-

trol, the power of contracting rhythmically when excited to do so, of conducting the impulse to contract from one part of the muscle to another, and of maintaining itself in a moderate state of tension or tone. When any of these properties is affected by disease some change in the force or rhythm of the heart-beat is apt to appear.

Heart-block is a condition in which the conducting mechanism between auricle and ventricle is destroyed in whole or in part so that the two beat at quite different rates; in some people this appears occasionally, causing slow pulse (20 or less per minute), fainting attacks, and rapid pulsation of the neck veins.

Rapid Heart (with a pulse of 200 or more per minute) may be due to unusual irritability of the heart muscle.

Slow Heart (with pulse of 40 or 60 per minute) may be natural or may be due to nerve or toxic influences on the heart muscle.

Cardiac Flutter and **Fibrillation** are conditions of great irregularity in the pulse due to the auricles emptying themselves not by regular waves but by a series of flutters or twitches instead, which fail properly to stimulate the ventricles.

ANGINA PECTORIS

Definition.—This is a term applied to a violent paroxysm of painful sensations in the chest, arising for the most part in connection with some form of heart disease.

Causes.—Angina pectoris is generally held to be a *neurosis*, or nervous affection of the heart, but its causation is still a matter of uncertainty. It seems occasionally to manifest itself where no organic heart disease is discoverable, either in life or after death, but in the great majority of cases some morbid condition of the heart's structure is undoubtedly present. A diseased state of the coronary arteries, the nutrient blood-vessels of the heart, has been found in a large proportion of the cases examined *post mortem*; but, on the other hand, these arteries may be found diseased where no paroxysm of angina had ever occurred; and further, it is well known that various other forms of heart disease may have angina pectoris associated with them as a prominent symptom, particularly disease of the aortic valve and aneurism situated at the commencement of the aorta. Angina pectoris is extremely rare before middle life, and is much more

common in males than in females. It must always be regarded as a disorder of a very serious nature.

Symptoms.—An attack of angina pectoris usually comes on with a sudden seizure of pain, felt at first over the region of the heart, but radiating through the chest in various directions, and frequently extending down the left arm. A feeling of constriction and of suffocation accompanies the pain, although there is seldom actual difficulty in breathing. When the attack comes on, as it often does, in the course of some bodily exertion, the sufferer is at once brought to rest, and during the continuance of the paroxysm experiences the most intense agony. The countenance becomes pale, the surface of the body cold, the pulse feeble, and death appears to be imminent, when suddenly the attack subsides, and complete relief is obtained. The duration of a paroxysm rarely exceeds two or three minutes, but it may last for a longer period. The attacks are apt to recur on slight exertion, and even in aggravated cases without any such exciting cause. Occasionally the first seizure proves fatal; but more commonly death takes place only after repeated attacks.

Treatment.—In the treatment of the paroxysm much relief is obtained by opiates, and by the inhalation, under proper precautions, of anesthetic vapors, such as ether, chloroform, and nitrite of amyl. Persons liable to suffer from attacks of angina should always carry with them the small glass "perles" of nitrite of amyl, which are intended to be crushed in the hand and inhaled whenever needful. To prevent the recurrence of the attacks, something may be done by scrupulous attention to the state of the general health, and by the avoidance of mental or physical strain, for it is certain that attacks in those who are the subjects of the disorder are often precipitated by errors in living, and by undue exertion or excitement.

PALPITATION OF THE HEART

Definition.—Palpitation is a condition in which the heart beats forcibly or irregularly, and the person becomes conscious of its action.

Causes.—As a rule we are quite unconscious of the beating of the heart, but when the nervous system is unduly excited its action may become unpleasantly palpable. It is liable to come on

at the time of puberty or of the change of life, and also in the weak state of body that accompanies great anemia, acute fevers, or neurasthenia. Sudden emotions, such as fright, and occasionally dyspepsia, may bring it on. A very frequent cause consists in overuse of tobacco, tea, coffee, or alcohol. Sometimes in bad cases of organic heart disease it may appear, though this is rare.

Symptoms.—There may simply be a fluttering of the heart and a feeling of weakness, which is often expressively described as "goneness"; or the heart may be felt pounding and the arteries throbbing, causing great distress to the affected person.

Treatment.—Mental quietness is the great requisite to still the overaction, and all sources of excitement must be avoided. The person should understand that, however unpleasant the condition may be, there is no danger from it, and that serious disease is very seldom the cause. Moderate exercise is a good thing, and the hours should be regular, a large portion of the day being spent in bed or lying down. If the person be a heavy smoker, this is probably the cause, and tobacco should be given up. Similarly, tea, coffee, and alcohol should be most sparingly partaken of, and any food likely to cause flatulent dyspepsia should be avoided.

The following are useful:

℞ Bromide of Sodium two drams
Tincture of Digitalis one fluid dram
Camphor-water, to make three fluid ounces
Mix.
Dose: One teaspoonful in water three times a day.

Or:

℞ Camphor two-grain pills
Dose: Take one pill every three hours.

The placing of the patient's feet in hot baths, like hot Epsom salt solution or hot mustard solution, is very beneficial.

THE ARTERIES AND THEIR DISEASES

The arteries are vessels which convey blood away from the heart to the tissues of the body, limbs, and internal organs. In the case of most arteries, the blood has been purified by passing through the lungs, and is consequently bright red in color, but

in the pulmonary arteries which convey it to the lungs it is impure, dark, and like the blood in veins, therefore called venous blood. The arterial system begins at the left ventricle of the heart with the aorta, which gives off branches that subdivide into smaller and smaller vessels, the final divisions, called arterioles, being microscopic, and ending in a network of capillaries, which perforate the tissues like the pores of a sponge, and bathe them in blood that is collected and brought back to the heart by veins.

The chief arteries after the aorta and its branches are: (1) the *common carotid,* running up each side of the neck and dividing into *internal carotid* to the brain, and *external carotid* to the neck and face; (2) the *subclavian* to each arm, continued by the *axillary* in the armpit, and the *brachial* along the inner side of the arm, dividing at the elbow into *radial* and *ulnar,* which unite across the palm of the hand in arches that give branches to the fingers; (3) the two *common iliacs,* in which the aorta ends, each of which divides into the *internal iliac* to the organs in the pelvis, and the *external iliac* to the lower limb, continued by the *femoral* in the thigh, and the *popliteal* behind the knee, dividing into *anterior* and *posterior tibial* arteries to the front and back of the leg. The latter passes behind the inner ankle to the sole of the foot, where it forms arches similar to those in the hand and supplies the foot and toes by *plantar* branches

Structure.—The arteries are highly elastic, dilating at each heart-beat as blood is driven into them, and forcing it on by their resiliency. Every artery has *three coats:* (*a*) the outer, or "adventitia," consisting of ordinary strong fibrous tissue; (*b*) the middle, or "media," consisting of muscular fibers supported by elastic fibers, which in some of the larger arteries form distinct membranes; and (*c*) the inner or "intima," consisting of a layer of yellow elastic tissue on whose inner surface rests a layer of smooth plate-like endothelial cells, over which flows the blood. Besides these the large arteries have the muscle of the middle coat largely replaced by elastic fibers, which render the artery still more expansile and elastic. When an artery is cut across, the muscular coat instantly shrinks, drawing the cut end within a fibrous sheath that surrounds the artery, and bunching it up, so that a very small hole is left to be closed by blood-clot. Although these tubes are subject, like

the muscles, to a great amount of strain and wear, they are, like the muscles, singularly free from diseases. One of the most important diseases is aneurism.

Arteriosclerosis, which is a condition of thickening and rigidity, comes on as a natural change in old age, but in some persons the change tends to come on early in life, possibly as a hereditary defect, while certain diseases, of which the chief are gout, syphilis, alcoholism, and lead-poisoning, bring it on in middle life. The results are general debility with wasting of the muscles, failure of appetite, tendency to faints and fits, headaches, coldness of the hands and feet with a great liability to gangrene, and, most important of all, an early failure of mental power due to thickening and blocking of the arteries in the brain, the young or middle-aged man becoming torpid, incapable of clear and connected thought and conversation, and liable to fits of absent-mindedness and aberration. There is a great liability to apoplexy, and Bright's disease comes on from changes in the kidney blood-vessels. All acute diseases, like pneumonia, influenza, etc., are more serious in such a person.

The same change may occur in small nodes or swellings here and there on arteries, this condition being called *atheroma.* If it occurs in a large artery, this is very likely in course of time to produce aneurism; if in a small one, clotting of the blood, so that serious states, like apoplexy and aphasia, may result if the small artery be in the brain. Following on atheroma, plates of lime may form in the arteries, or these vessels may, in extreme states, be changed into brittle calcareous tubes, very liable to breakage from slight injuries.

Syphilis and other inflammatory diseases may bring about an *obliterative inflammation,* in which the artery is more or less completely choked up.

ANEURISM

Definition.—Aneurism means a dilatation upon an artery due to yielding of the vessel wall and gradual stretching by the pressure of the blood.

Varieties.—There are several ways of classifying aneurisms, according to the point of view from which they are regarded. With reference to structure they have been separated into *true aneurisms,* in which the vessel wall is merely thinned and

stretched but still intact, and *false aneurisms,* in which the wall has been thinned away with the increase of the hollow, till all the coats of the artery have given way, and the blood is inclosed only by the greatly thickened fibrous tissues surrounding the artery. This distinction is useless, because all aneurisms of any size fall into the latter class. With reference to shape they are called *fusiform* when the artery is dilated all round for several inches, this form being common on the thoracic aorta; *sacculated* when a spot on one side has been pushed out gradually to form a sort of pouch, which is the usual form when medium-sized arteries are affected; *dissecting* when the inner coat has given way somewhat suddenly and blood has passed between the coats and torn its way some distance along the vessel; *miliary* when the aneurism is very small and looks like a millet seed on the side of the vessel, which is a form often found on the vessels in the brain. With reference to treatment they are divided into *internal,* affecting the great vessels in the chest and abdomen, which are amenable only to general treatment; and *external,* on the vessels of the limbs and neck which can be treated also by surgical means. Further, they are called after the regions in which they occur—*abdominal, thoracic, gluteal, popliteal, axillary,* etc.

Causes.—Within the blood-vessels there is always a great pressure, which rises with each heart-beat, the pressure at a beat, in the large arteries, being sufficient to drive the blood to a height of six or eight feet, i.e., about three pounds per square inch. Such a pressure would damage delicate organs, speedily tear the arteries, and further cause an unbearable jar to the body, were it not for the great elasticity of the arteries. They stretch as the blood is forced into them, and, quickly regaining their proper size, drive the blood on and equalize the pressure at the beats and rests of the heart. So perfect is this elastic state that a healthy artery is never torn, however strongly the heart beat or whatever muscular efforts be made. As age advances the arteries gradually lose their elasticity to some extent, but, as old men cannot make the vigorous efforts of youth, the arteries still seldom give way. Some diseases, of which alcoholism, syphilis, and gout are the chief, hasten the production of this senile change, and the inner coat of the arteries becomes here and there diseased, the change being known as atheroma. At these spots

the elasticity is much lessened, and consequently the cause predisposing to aneurism is present. Another predisposing cause is injury of the vessel from without by constant pressure, as by a tight garter behind the knee, or by actual wounding, but these are rare. Even a person suffering from extensive and advanced atheroma may go through life without the development of aneurism if an exciting cause be not present. This is furnished by arduous labor, or a single great strain in lifting a weight, running after a train, and the like. Accordingly, aneurism occurs in men (seldom in women) who have had, for some years, one or more of the diseases mentioned, and who are still in the active period of life, namely, in men about forty years of age.

Symptoms.—These vary greatly with the size and position of the aneurism, but there are some which are characteristic of all forms. The type of person who suffers is a man, in eight cases out of nine, about forty years of age, who has had an arduous or irregular life, or who has been fond of athletic exercises and high living. There may be other signs of arterial disease, such as cirrhotic Bright's disease, or a previous apoplexy. If the aneurism be in a limb, a round swelling is noticed, perhaps as large as a walnut or Mandarin orange, which expands and diminishes with each heart-beat, and this peculiarity is still more evident when the hand is laid on it. The swelling is generally painless, and the skin over it is unchanged (unlike an abscess). Aneurisms rarely occur farther from the trunk than elbow or knee. If the aneurism be internal it is situated upon a great vessel, and is often very large in size before it causes any very marked symptoms, which are mainly due to interference with surrounding organs. Pain is felt only when the swelling presses upon the nerves, upon the air passages, causing great breathlessness, or upon bone, wearing it gradually away. In the latter case pain may be so agonizing as to lead the sufferer to put an end to his life, although in early cases it is not infrequently mistaken for mere rheumatic pain. Breathlessness or difficulty in swallowing may occur where there is a large thoracic aneurism, from pressure on the windpipe or gullet, also cough of a barking, irritating nature, and changes in the voice, from irritation of the left recurrent laryngeal nerve. In thoracic and abdominal aneurism, though the swelling itself cannot be seen, there is a

bulging in the upper part of chest or abdomen, as the case may be, which can be felt to throb when one hand is placed on it in front and the other on the back; in a later stage pulsation can also be seen. In early cases this bulging may cause the subject of an aneurism to feel his coat too tight for him and have it let out, though there is no other symptom to make him imagine he has any serious disease. The *aneurismal tippet* is the name given to a network of dilated veins which appears upon the chest and shoulders, owing to obstruction of the circulation through the great veins by a thoracic aneurism. Swelling of the skin, or edema, is found with all aneurisms sooner or later from the same cause. Many other signs, such as inequality of the pupils, difference in the pulse on the two sides of the body, and murmurs heard over the swelling, are present in different aneurisms, but can be appreciated only by the trained observer. Aneurism is a serious disease, alike because it is apt to cause great interference with other organs; because it may at any time burst and cause sudden death from bleeding into the loose tissues or cavities of the body; and because it is a sign that the arteries are extensively diseased, and the person unfit for active work. The duration of life is generally only a few years, though it may be prolonged for twenty.

Treatment.—(*a*) *Medical.*—Although the aneurism tends constantly to increase, another tendency is for the blood in contact with the unhealthy wall to clot. If this be encouraged, the aneurism turns into a solid mass, which practically may be looked on as a cure, because there is no more tendency to grow or to burst. To this end the circulation must be quieted by rest in bed, freedom from business or worry, very spare diet without any stimulants, and depressant drugs like iodide of potash. Further, the tendency of the blood to clot is increased by taking salts of lime, and possibly by gelatine, and also by drinking as little fluid as possible, which has the other benefit of lessening the bulk and pressure of the blood. The régime prescribed consists of absolute rest, with a diet of only ten ounces of solid food and eight ounces of fluid in the day.

(*b*) *Surgical.*—Surgical means are applicable only when the aneurism is on an artery traversing the limbs or neck. The ancient method was to open the aneurism, clear out the contained blood and clots, and tie the vessel above and below it; but this

has been found both dangerous and unnecessary. The principal methods now employed are the following. *Pressure* on the artery between body and aneurism, kept up for many hours or some days, so as to diminish the force of the blood stream and allow a clot to form in the aneurism; this method is not very successful, and is very tedious. Ligature of the artery, either on the side next the body, when the circulation to the limb is carried on by anastomosis, and a clot forms in artery and aneurism; or, beyond the aneurism, when the artery, in consequence of a physiological law, dwindles, and a clot can form in the aneurism. One of these is the most usual method. *Irritation of the wall* of the aneurism by fine needles, which are pushed into it, and by which the inner surface is systematically scratched, so that clotting is started, or by the injection of various substances for the same purpose. With any surgical procedure the medical means are of course combined.

RAYNAUD'S DISEASE

Definition.—This is a curious condition in which the circulation becomes suddenly obstructed in outlying parts of the body. It is supposed to be due to spasm of the smaller arteries in the part affected, as the result of nervous influences, and its effects are increased both by cold and by various diseases affecting the blood-vessels.

Symptoms.—The condition is most common in early adult life, especially in the female sex, and is of all grades of severity. It is most commonly confined to the occurrence of "dead fingers," the fingers or the toes, ears, or nose becoming white, numb, and waxy-looking. The circulation is often so much reduced that the part does not bleed if pricked or cut. This condition may last for some minutes, or may not pass off for several hours, or even for a day or two. Persons affected in this way are often of a decidedly nervous temperament, and suffer from bilious attacks and other nervous disturbances.

In a more severe type, which depends apparently upon irregular contractions of the veins as well as of the arteries, periodic attacks come on in a similar manner, but the fingers and other parts affected, instead of being cold and white, are swollen, purple, and tingling.

In a third form, which is fortunately rare, after repeated attacks of one of the other forms, the circulation becomes so much cut off that the part dies and a localized gangrene results.

Treatment.—Massage and friction of the affected part often relieve the attack very speedily. The application of electricity has also been highly recommended. Persons who are subject to these attacks should be careful in winter to protect the feet and hands from cold, and should always use warm water when washing the hands.

THE VEINS AND THEIR DISEASES

Anatomy.—The veins are the vessels which carry blood to the heart after it has circulated through the tissues of the body. In general the veins lie alongside corresponding arteries that carry outward to the tissues the blood which afterward returns by the veins. The veins are, however, both more numerous and more capacious than the arteries, and, as a rule, there are two accompanying veins for each artery of moderate size. In addition to these deeply placed veins, there are superficial veins in the limbs, which can be readily seen in their distended state lying immediately beneath the skin.

Structure.—A vein is of similar structure to an artery, consisting of three coats, viz., outer fibrous, middle of muscular and elastic fibers, and inner composed of elastic membrane and flattened cells. Any vein has, however, a much thinner wall than its corresponding artery, especially as regards the middle coat. Most veins are provided with valves similar in structure to the aortic and pulmonary valves of the heart, and consisting each of two segments or pouches, which lie flat against the wall of the vein as the blood passes in the proper direction, or which meet and close the passage whenever the blood tends to run backward. The position of these valves can easily be seen upon the arm or leg by running the finger backward along a large vein, when the distended vein shows a little swelling at each valve. The valves are most numerous in the veins of the lower limb, those in the arm stand next in point of numbers, while there are few valves in the veins of internal organs.

Chief Veins.—Four *pulmonary veins* open into the left auricle of the heart, two coming from each lung. Into the right auricle

there open some small veins that run upon the walls of the heart and two great vessels, superior vena cava and inferior vena cava, that bring back blood from the body generally. The *superior vena cava* brings the blood from the head, neck, and upper limbs. It is formed by the union of two *innominate veins*, each of which results from the junction, at the root of the neck, of the internal jugular vein, from the neck, and the subclavian vein, from the upper limb. The *internal jugular vein* receives the blood from within the skull and collects branches from the face and neck as it runs downward alongside the carotid artery under cover of the thick sterno-mastoid muscle. One of its most important branches is the *external jugular vein*, which runs beneath the skin from the angle of the jaw straight downward to the middle of the collar-bone. This vessel can be readily seen when the veins of the neck are distended, and is very liable to be opened in wounds of this region. The *subclavian vein* is the last section of the system of veins that accompany the arteries in the arm, each vein being named after its corresponding artery. The superficial veins of the arm are of special interest, because the large *basilic vein* that runs up the inner side of the upper arm is the vein usually opened in blood-letting.

The *inferior vena cava*, which lies to the right side and in front of the spinal column, commencing at the junction of the two common iliac veins about the level of the navel, collects the blood from the lower limbs and abdomen. In the lower limbs and in the pelvis, the deeply placed veins correspond in name and in position to the arteries, while the surface veins of the lower limb empty their contents into an *external saphenous vein* on the back of the leg, and an *internal saphenous vein* that runs from the instep up the inner side of the leg, knee, and thigh. These veins, and especially the internal saphenous vein, are of special interest because of their liability to become distended or varicose, as the result of some impediment in the return of blood to the heart. Within the abdomen, the inferior vena cava receives branches corresponding to several branches of the aorta, its largest branches being the *hepatic veins*, which return not only the blood that has reached the liver in the hepatic arteries, but also blood which comes from the digestive organs in the *portal vein* to undergo a second capillary circulation in the liver.

It appears from what has been said that the blood circulating

in the uppermost parts of the body is returned to the heart by the superior vena cava, that from below the diaphragm by the inferior vena cava. There are, however, several connections between these two great vessels, the most important being three *azygous veins* that lie upon the sides of the spinal column, and some veins that emerge from the abdomen at the navel and connect the portal system with that of the superior vena cava. By these means the circulation is maintained even when one of these large vessels has been blocked by some disease within the chest or the abdomen.

The veins, like the arteries, are subject to few diseases, the chief being of a degenerative nature.

INFLAMMATION OF THE VEINS

Definition.—Inflammation of a vein is a condition which is serious mainly on account of the clotting of blood that usually takes place within the inflamed part (thrombosis), and the risk that such a clot may break up and portions be swept away by the circulation to lodge in other vessels (embolism). *Phlebitis* is the name commonly applied to general inflammation of a vein, while the term *periphlebitis* is used when the inflammation is limited to the loose connective tissue immediately surrounding the vessel. Occasionally the inflammation is of a very acute character, the vein becoming filled with a clot containing bacteria, which are carried to distant parts of the body and there produce abscesses. This condition, known as pyemia, is an extremely grave one. As a rule, however, phlebitis is of a more chronic type, running a course of some weeks and then improving under careful treatment.

Causes.—Inflammation rarely attacks veins that have been previously in a healthy state, but arises generally in veins that are varicose. It may develop in consequence of a bruise or wound of the vein; may come on in those who are the subjects of gout, rheumatism, or lead-poisoning; may follow infectious diseases like typhoid fever and pneumonia, or may affect the veins of those addicted to excessive use of alcohol. It will be noticed, therefore, that some injury of the vessel wall or the presence of some poison in the blood appears to be the exciting cause.

Symptoms.—In a typical case, the skin near the inflamed vein becomes red; the affected part becomes hot, and indeed the general temperature of the body may sometimes be raised; there is swelling both around the vein and of the part beyond it, so that, if a vein in the leg be inflamed, the foot is swollen; finally, considerable pain and tenderness to touch are experienced along the vein. When a clot forms in the vein, as it commonly does, the vessel can be felt as a hard line, and this blocked condition may persist for life, the vein being converted into a firm fibrous cord; or a passage may be tunneled through the clot after the inflammation has subsided.

Treatment.—Mention has been made of the great danger attaching to an inflamed vein, viz., that a portion of the clot may become detached and may block up some of the arteries in a distant organ, causing great damage or even sudden death. For this reason it is essential that the patient should rest absolutely quiet in bed for several weeks. When the vein is in one of the limbs, a suitable splint is usually applied. For the relief of pain, and with the view of diminishing inflammation, an ice-bag is sometimes used, or, more commonly, hot fomentations of the following are used:

℞ Lead and Opium Wash one pint
Directions: Saturate cloths and apply hot.

Or:

Sulphate of Magnesium Solution one pint
Directions: Saturate cloths and apply hot.

VARICOSE VEINS

Definition.—These are veins that have become stretched and dilated out of proportion to the amount of blood they have to carry. There are three positions in which the veins have a special tendency to become varicose. These are the veins about the lower end of the bowel, producing the condition known as hemorrhoids or piles; the veins of the testicle, producing varicocele; and the internal saphenous vein, with its branches on the inner side of the leg, knee, and thigh. Further, small veins are apt to become varicose here and there on a mucous membrane that is the seat of chronic catarrh and congestion; these minute varicose veins are found especially on the mucous membranes of

the throat and stomach, and may give rise, now and then, to serious hemorrhage, particularly in the case of persons addicted to alcoholism. Only the varicose veins of the limbs are considered here, those in other parts of the body having been dealt with elsewhere.

Causes.—Undoubtedly some persons are more liable to the formation of varicose veins than others. The veins vary greatly in thickness in different persons and at different portions of the same vein, so that the formation of the vessel wall and the condition of surrounding parts have much to do with its dilatation. Thus the tendency to varicose veins is often hereditary. Employments that necessitate long-continued standing, with little vigorous muscular exertion, not only throw a great strain upon the veins of the leg, but fail to provide the pumping action that muscular contractions exert in emptying the veins. The evil effects of prolonged standing are increased by tight garters, and, as regards the left leg especially, by constipation. Pregnancy is another constant cause of varicose veins, though the condition tends to disappear after the child is born.

An important consideration is that, after a vein has begun to dilate, its walls become weaker and its valves useless. Thus the weight of the column of blood in the limb presses down with increasing force, the condition tends to grow worse and worse, and to spread into neighboring veins.

Symptoms.—At first the only symptoms are a feeling of weight and aching in the limbs, accompanied sometimes by cramps. This is experienced either at night, after a long day's standing, or in the morning when the feet are first put to the ground. After the condition becomes marked, there is often swelling of the feet, especially above the ankles, that quickly disappears when the patient lies down. Varicose veins that have lasted many years are liable to become inflamed, and to produce eczema and ulceration of the skin.

Treatment.—Varicose veins, as stated above, tend, when untreated, to become worse and worse. Treatment which is directed merely toward checking their increase and toward preventing ulceration is known as palliative treatment; the entire removal of the distended veins is known as radical treatment.

Palliative Treatment.—In slight cases, it is often sufficient to avoid the use of garters, to remedy constipation, to avoid stand-

ing as much as possible, and, after the day's work is done, to sit with the feet elevated on a couch or chair. In more marked cases, some mechanical support for the superficial veins is necessary, in order to counteract the downward pressure of the blood in the long saphenous vein, whose valves have become useless. For this purpose a rubber bandage, an elastic or crape bandage, or elastic stockings may be used. The rubber bandage is cheapest, because the others not only stretch, but must be discarded when they become soiled by perspiration. Crape bandages also cost little, and may be replaced, therefore, as soon as they begin to stretch; they are also very efficient, and not so heavy as the rubber bandage. The rubber bandage should be applied over thin cotton stockings, should simply be unrolled, not stretched, on the leg, and—a very important point—should be taken off the last thing at night and reapplied before the patient puts his feet to the ground in the morning. Crape bandages are used in a similar manner. Some persons find elastic stockings much more comfortable than bandages. There must be no tight band at the top of the stocking, but slipping down may be prevented by suspenders; while, of the various kinds, the spiral silk elastic stocking is generally regarded as the best.

Radical Treatment is adopted when the veins are excessively dilated or when they cause much annoyance. Although various methods, such as ligature of the veins here and there, and injection of irritants like carbolic acid into and around the veins, have been tried from time to time, the most successful method consists in turning up a flap of skin on the inner side of the thigh or knee, ligaturing the vein in two places and removing the intervening dilated portions *en masse*. It is usually necessary to do this both high up on the thigh, at the inner side of the knee, and at any other points where the veins of the surface communicate with those buried among the muscles. The wound heals quickly, and in most cases the cure is complete.

THE BLOOD AND ITS DISEASES

Blood is a fluid which circulates through the arteries, capillaries, and veins exchanging fluid and gases with the bodily tissues. The latter receive the products absorbed from the food and oxygen taken up by the blood in its passage through the lungs, while

the blood removes from the tissues carbonic acid gas to discharge it in the lungs, and various waste products, of which it rids itself in its passage through the kidneys.

Composition.—The blood consists, in addition to the fluid, of corpuscles, minute bodies $\frac{1}{3000}$ of an inch, or less, in size. These are of three kinds: red corpuscles, white corpuscles, and blood platelets. In the *fluid* are dissolved the various salts and proteins which nourish the tissues, and also the waste products, such as uric acid, destined for removal from the body. The *red corpuscles* act as the carriers of oxygen. Each is a disk, hollowed out on either surface, and contains a substance called hemoglobin, which acts as a medium of interchange between the oxygen of the air in the lungs and the tissues requiring it. There are about 5,000,000 red corpuscles in every cubic millimeter of blood, the blood of women containing slightly fewer than that of men. The *white corpuscles* are of several different kinds, and wander through the walls of the small blood-vessels, upon occasion, into the tissues; here they have many functions to perform, of which the chief are the repair of wounds, the absorption of foreign bodies, and the destruction of bacteria; their dead bodies form, when in large numbers, the matter or pus of abscesses. Their number is about 1 to 500 of the red corpuscles. The chief varieties of white corpuscles are those with a single large nucleus (large mononuclear), those with a nucleus consisting of several variously shaped parts (polymorphonuclear), and small corpuscles resembling those formed in the lymphatic glands (lymphocytes). Also they are classed according to whether the granules they contain stain with a blue, alkaline dye (basophile), or with a red, acid dye (eosinophile). The *blood platelets* are extremely minute, and perhaps play some important part in clotting.

Examination of Blood.—The corpuscles of the blood may be counted. For this purpose a minute drop is drawn up into a special graduated tube provided with a bulb in which the blood is mixed with a suitable diluting fluid. A drop of this diluted fluid is blown out upon a special glass slide on which have been ruled with a diamond a number of lines that divide the surface into areas of a 400th square millimeter in size. A cover glass is then lowered upon the drop and so supported on a raised glass

rim that a definite distance ($\frac{1}{10}$ millimeter) separates it from the ruled surface. The slide is then placed under a microscope, the average number of corpuscles that have settled on each square is counted and thus the number in $\frac{1}{4000}$ of a cubic millimeter is ascertained.

Formation of Blood.—The life of a corpuscle is probably about three or four weeks; at all events, the blood-forming organs can restore the blood after extreme hemorrhage to its normal state in this time. To renew the wear, as well as to make good losses by wounds, a constant manufacture is going on in the marrow of the smaller bones, and also probably in the spleen.

Amount of Blood.—This is about one pound for every fourteen pounds of total body weight, so that a fairly heavy person has twelve to fourteen pounds of blood. A loss of five pounds has, however, been known to cause death.

Functions of Blood.—The red corpuscles act as oxygen carriers, the white corpuscles have mainly a defensive action against the onset of disease. The fluid of the blood carries in solution various waste products such as carbonic acid gas to be exhaled by the lungs, urea and salts to be removed by the kidneys; also it distributes food-stuffs, such as sugar and proteins absorbed from the intestine and elaborated by various glands; and it forms a general medium of communication between organs that are chemically interdependent, for example carrying to the stomach the materials for the gastric juice, to the muscles ferments formed in the pancreas, etc., and absorbing secretions needed for the general purposes of the body, like those of the thyroid gland and suprarenal bodies.

Venesection consists in the opening of a vein, usually, owing to its superficial position, one of the veins just above the bend of the elbow. After the desired amount has flowed out, a pad and tight bandage are used to stop the bleeding. This method is of use in cases of apoplexy, of failure of the heart from overdistention in drowning, heart-disease, and the like, and also is sometimes still employed in acute fevers, where some disease-poison is circulating in the blood. An effect similar to that of general bleeding is produced by free purgation.

ANEMIA

Definition.—Anemia means literally absence of blood, but is a term used to cover the symptoms due to any impoverishment in quantity or quality of the corpuscles or fluid of the blood.

Cause.—Anemia may be due to some other disease which causes an evident loss or failure in formation of blood, and is then called secondary anemia. Or the cause may be very obscure, being a disease of the blood itself, as a result of which other organs are involved, in which case it is said to be primary. Primary anemia is of two very distinct kinds called (1) chlorosis, (2) pernicious anemia.

Secondary Anemia.—Secondary anemia is due to loss of blood from a wound, to want of proper food, or to the draining away of albumin by chronic suppuration, by albuminuria in Bright's disease, and by too prolonged suckling of a child, or, finally, to long-continued action of such poisons as lead in the water-supply, coal-gas leakage, malaria, or syphilis.

Symptoms.—The symptoms vary slightly, according to the cause. Generally speaking, the symptoms are similar to those of chlorosis.

Changes in the Blood.—After great loss of blood the remaining blood is much diluted with water from the tissues, and so the number of corpuscles in a drop becomes much smaller; otherwise the changes are like those of chlorosis.

Treatment is that of the diseases which have been stated to cause secondary anemia. Tonics containing iron, like those suggested under chlorosis, are of great value.

CHLOROSIS

Causes.—Chlorosis occurs in girls usually from fourteen to twenty years of age. Heredity to a certain extent plays a part in its causation, and the type of girl who is affected is generally small, of poor physique, and, as Virchow pointed out, provided with small blood-vessels, and, probably, with poorly developed blood-forming organs. Work and sleep in badly ventilated rooms among city-bred girls brings it on. The attacks of blood-

lessness appear in girls during the teens and early twenties, but usually pass off before the age of thirty, especially in married women. Not infrequently a healthy country-girl on coming to service in a large city, where she has less fresh air, longer work, and different food, becomes speedily anemic.

Symptoms.—The sufferer is a young woman. Her first complaint is usually either dyspepsia or breathlessness, while her friends notice the increasing pallor of her face, which assumes a peculiar greenish-gray tinge, and they often fear she is in a decline. The breathlessness comes on especially after exertion, such as going up a hill or stairs, and is generally accompanied by palpitation of the heart. There may even be a tendency to fainting, owing to temporary dilatation of the heart, and, for the same reason, the pulse is weak, there is throbbing in the arteries, often very disagreeable to the sufferer, and cardiac murmurs develop. Dyspeptic symptoms are almost always present, taking the form of flatulence after meals, or heartburn, and there is a tendency to the formation of a gastric ulcer. Constipation is so regularly present that it has been regarded as a cause of the condition. Appetite is not generally lost but is often perverted, and there may be a hankering after acid food, or even quite indigestible articles. Menstrual disorders are the rule, either pain, irregularity, or, most often, stoppage. As the case improves under treatment these pass away gradually, and in every case one looks for a complete cure in time.

Changes in the Blood.—There is in this disease no actual destruction of blood, but a diminution of quality. The number of corpuscles in a drop is only slightly reduced, but the hemoglobin or iron-containing pigment of the corpuscles is lessened, and consequently the blood is paler. Also, in the severer forms of chlorosis, some corpuscles are misshapen, some too large, some too small, some twisted, or spiny, instead of being smooth round disks. This loss of form is known as "poikilocytosis."

Treatment.—There is one definite remedy in this disease, and that is iron. How it acts is not quite certain, because the food contains quite sufficient iron, although it is not used by the system, and because in treatment much larger quantities are given than are necessary to supply the actual deficiency in the blood-corpuscles, for the deficiency in the whole body never

amounts to thirty grains. Possibly the iron exerts its beneficial effect largely by virtue of its action as an antiseptic in the bowels.

The following formula is recommended:

℞ Blaud's Pills five grains
Dose: Two pills after meals.

Or:

℞ Syrup Iodide of Iron four fluid ounces
Dose: Ten drops in milk, three times a day.

The iron must be taken for four or five weeks, and it is well after bad cases to take small doses off and on for months. Constipation, above all, must be treated, and there should be one movement daily. Menstrual irregularity should be let alone, as it is merely a symptom, and stoppage of the menses by preventing further loss of blood is beneficial, while the function becomes natural as the anemia lessens. These remedies will not, however, operate, unless good food, fresh air, daily exercise, and plenty of time for sleep be added. In every case recovery is to be looked for, though the case may require some months' treatment.

PERNICIOUS ANEMIA

Causes.—Pernicious anemia comes on so gradually that its causes have not yet been definitely agreed upon by scientists. It is an uncommon disease, but is important because of its almost invariable, though gradual, progress to a fatal termination. Some cases have followed childbirth in which there had been excessive loss of blood. Others accompany extreme dyspepsia, due to wasting of the stomach and bowels, but whether the bloodlessness is cause or effect is not certain. Some cases have been due to the presence of intestinal parasites. Others are associated with repeated small hemorrhages beneath the skin or beneath the lining membrane of the bowels, while in many others the teeth are defective and their cavities and sockets filled with organisms, especially streptococci.

Symptoms.—The sufferer is usually elderly. The onset is so very gradual that the illness may have lasted months before pallor, which gives the skin a lemon-yellow color, added to lan-

guor and feebleness, calls attention to it. The muscles become flabby, and debility increases more and more. The pulse gets steadily weaker, swelling about the ankles appears, and small hemorrhages may be seen under the skin. Owing to hemorrhages into the retina, vision may become impaired. Indigestion, vomiting, and diarrhea are common symptoms, and before the sick person becomes too weak to walk there may be great ataxia in movement. The temperature is often raised. Mental peculiarities not uncommonly develop with the progress of the disease. It is very important not to mistake this form of anemia for one of the others, because while they are readily cured in most cases, only thirty per cent. of cases of pernicious anemia, according to Osler, get better, and even these cases relapse within five years.

Changes in the Blood.—There is an actual, constant destruction of the corpuscles in this form. Consequently, the number may fall to one twentieth of what it ought to be. In healthy persons the constant wear of the corpuscles is made up by a continuous formation of new ones in the marrow of the bones, but in pernicious anemia the process is hurried and pushed to an extreme degree. Consequently, defective forms escape into the blood, and, in addition to the misshapen corpuscles, whose distortion is often extreme, nucleated red cells and other immature forms (*megaloblasts*) are seen. The hemoglobin is not diminished relatively to the number of corpuscles and may actually be proportionately increased.

Treatment.—Pernicious anemia, as stated, is not very amenable to treatment. A few cases of very bad anemia recover for some years, but, as a rule, only temporary improvement can be looked for. It might be supposed that the injection of blood from a healthy person would be a benefit, but this is not the case, since all extraneous blood-corpuscles are rapidly broken up. Still, it is worth while trying in cases where a thoroughly healthy person can be found to consent to the withdrawal of a few ounces from his body. The remedy which has been most successful is arsenic in large doses; salvarsan has been recommended; while bone-marrow is sometimes helpful. Attention to the teeth is of the utmost importance.

Arsenic may be used in the form of Fowler's Solution, but caution is necessary regarding the way it is to be used to ob-

tain the best results. Below is the proper method, which must be followed if good results are to be obtained:

℞ Fowler's Solution one-half ounce

Directions: Three drops in water three times a day. Increase the dose to four drops at the end of four days; five drops at the end of one week; ten drops at the end of the second week; sixteen drops at the end of the third week. Symptoms of an overdose are puffiness under the eyes, vomiting, and diarrhea, at which time the medicine is to be discontinued for a week. Then start again at three drops and increase as above, until a dose of sixteen drops is taken, or the symptoms of an overdose are present.

ADDISON'S DISEASE

Definition.—This disease consists of a state of anemia, weakness, depressed circulation, and dyspepsia, while its most obvious symptom is a peculiar bronzing of the skin. It is due to disease of the suprarenal bodies, or of the structures near them.

Causes.—Men, and especially young adults, suffer oftener than women, in the proportion of two to one. The condition found after death is generally a tuberculous condition of the suprarenal glands, causing their destruction to a greater or less extent, or disease of this nature in the tissues near the glands, and involving the nerves and lymphatic vessels connected with the glands, so as to interfere with their proper functions. More rarely it is caused by other diseases, such as atrophy or cancer of, or hemorrhage into, the glands. There are two methods by which the effect may be produced. Either the disease destroys the secreting tissue of the glands and so checks the formation of the very powerful secretion which these glands have been shown to produce in health, and which is necessary for the proper functions of the body, as for example for the maintenance of the blood-pressure and the contractile power of the muscles; or the disease produces its effect by interfering with the tissues in which lie the nervous and vascular connections of these glands.

Symptoms.—In the words of Addison, the main symptoms are: "Anemia, general languor or debility, remarkable feebleness of the heart's action, irritability of the stomach, and a

peculiar change of color in the skin." The color ranges from yellow to dark brown, or even black, and though at first marked on the exposed surface, as the face and hands, and on regions where pigment occurs naturally (groins, armpits, etc.), it gradually increases in area and in depth of tint. The next most prominent symptom is weakness on the least exertion, with giddiness, noises in the ears, or even faintings when efforts are made. Nausea, vomiting, occasional diarrhea, are also symptoms, and there is palpitation of the heart and feebleness of the pulse. The sufferer in general gets gradually worse, though there may be periods of betterment lasting some months. The disease rarely lasts longer than three or four years, and it may prove fatal within some months. Sometimes recovery may occur.

Several other diseases cause a limited pigmentation, especially of the face, so that this symptom must not always be taken as a sign of Addison's disease. Such conditions are disordered liver with constipation, abdominal cancer, menstrual irregularity, and exophthalmic goiter.

Treatment.—A cure can seldom be looked for. The sufferer should be kept in bed, or at all events should rest as much as possible. Cod-liver oil, tonics, and iron if the anemia is marked, are given. The diet should be light and nutritious, consisting especially of milk. Marked temporary improvement results from treatment by suprarenal gland feeding, a couple of fresh sheep's suprarenal glands being eaten daily in a sandwich, or, better, a carefully prepared extract being administered by the mouth or by hypodermic injection. The results of this treatment are, unfortunately, only temporary.

The following formula has been employed extensively:

℞ Extract of Suprarenal Glands one dram
Directions: Make into twenty capsules, and take one after meals.

LEUCEMIA, OR LEUCOCYTHEMIA

Definition.—This is a disease of chronic type, in which the number of white corpuscles in the blood is permanently increased. The disease is also characterized by great enlargement of the

spleen and changes in the marrow of the bones, or by enlargement of the lymph glands all over the body. The history of the disease is interesting by reason of the curious fact that the condition was first described by Virchow in Germany and Hughes Bennett in Scotland within a few weeks of each other, in the year 1845, the former giving it the name of leucemia, the latter that of leucocythemia. According to the type of corpuscles chiefly present, the disease is called (1) lymphatic leucemia, lymphocythemia, or lymphemia, and (2) splenomedullary leucemia, leucocythemia, or myelemia.

Causes.—The causes of the disease are quite unknown. It may occur at any age, though most frequently in middle life, and among males. Malaria and syphilis appear in some cases to have been connected with the disease, which is also known occasionally to set in after some wound or abscess has occurred.

Symptoms.—The onset is gradual, and the first symptoms which occasion discomfort are either swelling of the abdomen and shortness of breath, due to painless enlargement of the spleen, or the enlargement of glands in the neck, armpits, etc., or the pallor, palpitation, and other symptoms of anemia which often accompany the malady. Occasional hemorrhages from the nose, stomach, gums, or bowels may occur, and may be serious. Dropsy of the feet and legs is not uncommon, from obstruction of the lymphatic vessels by the enlarged glands and spleen. Diarrhea also may become very troublesome. Generally, there is a slight degree of fever. When the blood is examined microscopically, not only is there an enormous increase of the white corpuscles, which may be multiplied thirty or sixty-fold, but various immature forms of corpuscles are found. In the lymphatic form of the disease, the white corpuscles consist chiefly of corpuscles resembling in some measure the lymph corpuscles, which, in healthy blood, are present only in small numbers. In the splenic form, myelocytes, or large immature corpuscles out of the bone-marrow, which are never present in healthy blood, appear in large numbers.

Cases sometimes prove fatal in a few weeks or months; generally they survive only for some years.

Treatment.—Fresh air, good diet, and rest are essential. No drug or other agency has been found which will cure the disease, though it sometimes abates for some time spontaneously, and

arsenic and benzole have been found to check it temporarily. The enlarged spleen has been removed by operation, though the result gives no encouragement for future trial. Recently the application of X-rays to the abdomen and to the limb bones has been tried, and has been successful, in some cases, both in reducing the size of the spleen and in improving the condition of the blood.

CIRCULATION OF THE BLOOD

This principle was enunciated for the first time by William Harvey in a book published in 1628. His theory, which is now considered so obvious a truth as to be mere common sense, was bitterly opposed at first, and was the result of many years of careful reasoning and ingenious experimentation on Harvey's part. Indeed, Harvey confesses that the subject, when he began it, seemed to him so overwhelmingly difficult that he fancied the motions of the heart could be "understood only by God." The proof of the facts of circulation was certainly one of the most important discoveries in medical science, and was at first regarded as so subversive that a professor of Montpelier was requested to resign his chair for supporting Harvey's views. Prior to Harvey's discovery the generally accepted view was that the arteries contained a mixture of air and "vital spirits," with only an accidental admixture of blood, and that the heart by its motions alternately sucked in more air through the pores of the skin and those of the lungs, and through the same channels expelled "fuliginous vapors." The "vital spirits" were assumed to be manufactured by the heart and to be the origin of all activity, while the "fuliginous vapors" were a form of smoke resulting from the bodily motions. The blood in the veins was supposed to be derived from the liver, which absorbed the "juices of the food," and to ebb and flow in and out of the various organs for their nourishment. Harvey proved, first of all, mainly by the examination of living animals, that the arteries contain only blood. Secondly, he showed by three main propositions that this blood must go round from arteries to veins in a continuous circuit. (1) The quantity of blood passing from the veins into the heart in the course of a whole day is so great that it is quite impossible it could all be manufactured from the food.

(2) The blood in the arteries passes in a constant stream to all the members of the body, and does not return by the same route. (3) The blood in the veins flows incessantly to the heart, and does not ebb and flow, as is shown by the valves in veins and in the heart, and by the fact that veins when pressed on do not fill from above. Having proved these points, he assumed there must be "pores in the flesh" through which the blood "percolated" from the ends of the arteries to the beginnings of the veins. The last link in the evidence was supplied some thirty years later by Malpighi, an Italian scientist, who with the help of the microscope showed these "pores" to be the minute vessels now called capillaries.

The Course of the Circulation is as follows: The veins pour their blood, coming from the head, trunk, limbs, and abdominal organs, into the right auricle of the heart. This contracts and drives the blood into the right ventricle, which then forces the blood into the lungs by way of the pulmonary artery. Here it is contained in thin-walled capillaries, over which the air plays freely, and through which gases pass readily out and in. The blood is consequently purified, and passes on by the pulmonary veins to the left auricle of the heart. The left auricle expels it into the left ventricle, which forces it on into the aorta, or great artery, by which it is distributed all over the body. Passing through capillaries in the various tissues it enters the veins, which ultimately unite into two great veins, the superior and the inferior vena cava, these emptying into the right auricle. This complete circle is accomplished by any particular drop of blood in about half a minute.

In one part of the body there is a further complication. The veins coming from the bowels, charged with food material and other products, split up, and their blood undergoes a second capillary circulation through the liver. Here it is relieved of some food material and purified, and then passes into the inferior vena cava, and so to the right auricle. This is known as the "portal circulation."

The circle is maintained always in one direction by four valves, situated one at the outlet from each cavity of the heart.

The blood in the arteries going to the body generally is bright red, that in the veins dull red in color, owing to the former being charged with oxygen, the latter with carbonic acid. For

the same reason the blood in the pulmonary artery is dark; that in the pulmonary veins, bright.

It must be remembered that there is no direct communication between the right and left sides of the heart, the blood passing from the right ventricle to the left auricle through the lungs.

In the embryo, before birth, the course of circulation is somewhat different, owing to the fact that no nourishment comes from the bowels nor air into the lungs. Accordingly, two large arteries pass out of the navel, and convey blood to be changed by contact with maternal blood, while a large vein brings this blood back again. There are also communications between the right and left auricle, and between pulmonary artery and aorta. At birth all these extra vessels and connections close and rapidly shrivel up.

Circulation of Secretions.—There are many subsidiary circulations in the body, depending, in part of their course, upon the circulation of the blood. The *lymph*, which percolates out from the minute blood-vessels to bathe the tissues with nutritive material, does not return directly, but is collected by a multitude of small lymphatic vessels which, passing through glands as through filters, unite ultimately into two vessels, the thoracic duct and right lymphatic duct, and these open into the veins of the neck on the left and right sides respectively. The *saliva*, when swallowed, acts upon the food in the stomach during the first twenty minutes of digestion, but is gradually reabsorbed and carried round to the salivary glands again. This is proved by swallowing certain drugs in capsules, for example, iodide of potash, which are also absorbed from the stomach, and may, after fifteen minutes or thereabout, be found, by chemical tests, in the saliva. The *gastric juice* is secreted in much larger quantities than is generally supposed, about fourteen pints or more being mixed weekly with the food. Of this, the greater part is reabsorbed in the bowels, and probably used over again by the stomach. The *bile*, secreted by the liver and poured into the small intestine, to the amount of about two pints daily, circulates back to the liver by way of the lymphatics and then the blood stream, only about one eighth of the whole amount being daily lost in the stools. Other glands produce secretions which similarly circulate and produce some important effects in the blood, in addition to their more obvious functions. There is thus

some scientific justification for the old theory of the "humors" in the causation of disease.

DISORDERS OF THE CIRCULATION

The steady maintenance of the circulation depends upon two factors: (1) the power and regularity of the heart; and (2) the condition of the walls of the vessels, especially of the small arteries. The arteries are not rigid tubes, nor are they merely elastic tubes of a definite size, for each vessel has the power of dilating and contracting within wide limits, so as to let a larger or smaller stream of blood pass through. These motions are controlled by constricting and dilating nerves governed by the nervous system, and upon the action of these, more than upon the heart, depends the state of circulation in various parts. For example, when cold strikes the skin the constrictor nerves are stimulated, the vessels contract, and the blood is driven from the skin, which becomes pallid. On the other hand, blushing is due to loss of control by these nerves over the vessels, or, when the redness is extreme, to stimulation of the dilating nerves by some emotion powerfully affecting the nervous system. Similar changes occur, under other conditions, in all the organs.

Causes and Symptoms.—*Inflammation* in its early stages is associated with great redness and swelling, due to excessive inflow of blood to the inflamed part through widely dilated arteries. *Congestion* is a condition sometimes due to inflammation, sometimes to an obstruction to the veins which should carry off the blood, or very often to the feebleness of the heart, which cannot drive the blood upward from dependent parts like the feet, or like the back portions of the lungs in bed-ridden persons. In old persons with diseased vessels, in which blood-clots are liable to form, congestions of the brain readily take place from such obstructions. In weak persons, or those exhausted by illness, lying constantly on the back, congestion of the lungs is very apt to come on. Congestion of the lungs with bronchitis, and congestion of the liver and stomach with various disorders of digestion, are common results of valvular disease of the heart. *Dropsy* and *varicose veins* are similar disorders, often due to obstruction to veins. Dropsy is also a usual result of valvular heart disease, but still more

commonly results from kidney disease. *Bloodlessness* of parts is a disorder in the opposite direction, due to spasm and extreme narrowing of arteries. It occurs in the form of "dead fingers," generally in women of a nervous temperament. A local blanching often preceeds *chilblains,* which are due probably to a constriction in the veins, associated with a feebly beating heart, and which occur in persons of sluggish circulation. *Cold feet and hands,* especially at night, form a milder variety of the same condition. An internal condition of similar nature occurring in nervous persons and those subject to chilblains produces *catarrh of the small intestine,* with pain, coldness, and flatulence about the abdomen, and attacks of alternate constipation and diarrhea. *Insomnia* in elderly persons is very frequently due to a disordered circulation, either because the vessels of the brain remain distended after the day's work is done, or, less commonly, because the vessels are extremely narrowed by disease, in either case that moderate fullness essential to sleep not being present.

Treatment.—When any failure of the heart is present, the case should be under the constant supervision of a medical man, and is treated by various cardiac tonics, by rest, and by graduated exercises. Cases of disordered circulation depending on the vessels are much benefited by cold baths and daily vigorous exercises, while good diet, warm clothing, and tonics are of the greatest importance for their cure.

The following is a favorite formula:

℞ Tincture of Nux Vomica one fluid ounce
Dose: Five drops three times a day in water, after meals.

PURPURA

Definition.—This is a disease characterized by the occurrence of purple-colored spots upon the surface of the body, due to extravasations of blood in the skin, accompanied occasionally with hemorrhages from mucous membranes. Difference of opinion has prevailed among physicians as to whether these symptoms are to be regarded as constituting a disease *per se,* since they are frequently seen in connection with various morbid conditions. Thus in persons suffering from such diseases as rheumatism, phthisis, heart disease, cancer, Bright's disease, jaundice, as well

as from certain of the infectious fevers, extravasations of the kind above mentioned are not infrequently present. But the term "purpura" is, strictly speaking, applicable only to those instances where the symptoms exist apart from any antecedent disease.

Causes.—The causes of purpura are not well understood. The condition of the blood has been frequently investigated, but no alteration in its composition detected. The view most commonly held is that the disease depends on an abnormal fragility of the minute blood-vessels owing to their malnutrition. It would seem sometimes to arise in persons enjoying perfect health; but in a large proportion of instances it shows itself among those who have been exposed to privation or unsanitary conditions, or whose health has become lowered. Young persons suffer more frequently than adults, and repeated attacks may occur. Very often an attack of purpura is associated with rheumatic pains in the limbs. Purpura has some points of resemblance to scurvy, but a clear distinction both as to causation and symptoms can be established between the two diseases.

Symptoms.—The complaint is usually ushered in by lassitude and feverishness. This is soon followed by the appearance on the surface of the body of the characteristic spots in the form of small red points scattered over the skin of the limbs and trunk. They are not raised above the surface, and they do not disappear on pressure. Their color soon becomes deep purple or nearly black; but after a few days they undergo the changes which are observed in the case of an ordinary bruise, passing to a green and yellow hue and finally disappearing. When of minute size they are termed "petechiæ or stigmata"; when somewhat larger, "vibices"; and when in patches of considerable size, "ecchymoses." They may come out in fresh crops over a lengthened period.

The form of the disease above described is that known as *purpura simplex*. A more serious form of the malady is that to which the term *purpura hemorrhagica* is applied. Here, in addition to the phenomena already mentioned as affecting the skin, there is a tendency to the occurrence of hemorrhage from mucous surfaces, especially from the nose, but also from the mouth, lungs, stomach, bowels, kidneys, etc., sometimes in large and dangerous amount. Great physical prostration is apt to

attend this form of the disease, and a fatal result sometimes follows the successive hemorrhages, or is suddenly precipitated by the occurrence of an extravasation of blood into the brain.

Treatment will bear reference to any causes which may be discovered as associated with the onset of the disease, such as unfavorable hygienic conditions, and nutritive defects should be rectified by suitable diet. The various preparations of iron seem to be the best medicinal remedies in this ailment, while more direct astringents, such as gallic acid, ergot of rye, turpentine, or acetate of lead, will in addition be called for in severe cases, and especially when hemorrhage occurs.

The following may be used to increase the coagulability of the blood:

℞ Calcium Chloride one-half ounce
Water four fluid ounces
Mix.
Dose: One teaspoonful in water every eight hours for three or four days.

Or:

℞ Fluidextract of Witch-hazel two ounces
Dose: One teaspoonful every three hours in water.

SEPTICEMIA, OR BLOOD-POISONING

Causes.—This may follow in any weakly person (diabetics and alcoholics especially), or even in strong persons, from a very virulent bacterial infection of any wound or acutely inflamed area. Women are liable to a peculiarly severe form after delivery—puerperal fever.

Symptoms.—High temperature, sweating rigors (shivering fits), delirium, pains all over the body, and sometimes the formation of abscesses at many different points. The condition is always a serious one, and may be fatal, although modern antiseptic surgery has immensely reduced the frequency of blood-poisoning.

Treatment.—Even after the development of blood-poisoning the chief attention will still be directed to the original source of the mischief—the factory whence the poisons are being poured into the system. Such measures as opening of abscesses, anti-

septic baths, or even amputations are required. The patient needs good dieting to keep up his strength—strong soups, beef extracts, eggs, plasmon, and the like. Of drugs probably quinine is the most useful in allaying the fever. Give a single dose of thirty grains of sulphate of quinine. If bought in tablet form, as it probably will be, powder it and give it suspended in milk. The temperature should fall in about a couple of hours. The dose may be repeated in six or eight hours. Serum treatment is now employed in some suitable cases.

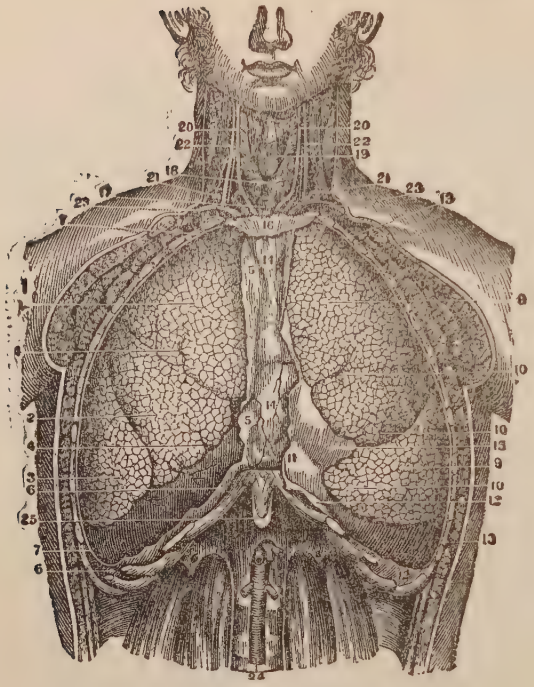
℞ Tincture of Iron Chloride five teaspoonfuls
Water, to make four ounces
Mix.
Dose: One teaspoonful in water every three or four hours.

DISEASES OF THE RESPIRATORY ORGANS

THE LUNGS

THE lungs form a pair of organs situated in the chest, and discharge, perhaps, the most important function of vital activity, viz., respiration. The air, which enters through the nose and passes down the throat, larynx, and windpipe in succession, reaches the lungs by the right and left bronchial tubes, into which the windpipe divides within the chest, at the level of the second rib. The texture of the lungs is very highly elastic, so that when the chest is opened each lung collapses to about one third of its natural bulk.

Form and Position.—Each lung is roughly conical in shape, with an apex projecting into the neck, and a base resting upon the diaphragm. The rounded outer surface of each is in contact with the ribs of its own side, while the heart, lying between the lungs, hollows out the inner surface of each to some extent. There is an anterior border, along which the outer and inner surfaces meet, and the borders of the two lungs touch each other for a short distance behind the middle of the breast-bone. The apex, which is blunt, extends 1½ inches or more into the neck above the line of the collar-bone, being covered here by the muscles of the neck. The base is deeply hollowed, in correspondence with the domed shape of the diaphragm, which is pushed up by the liver on the right side, and by the stomach and spleen on the left. The right lung is split by two deep fissures into three lobes; the left has two lobes divided by a single fissure. The weight of the two lungs together is about forty ounces, the right being rather heavier than the left, and the lungs of men much heavier than those of women. Each lung is enveloped in a membrane, the pleura or pleural membrane, in such a way



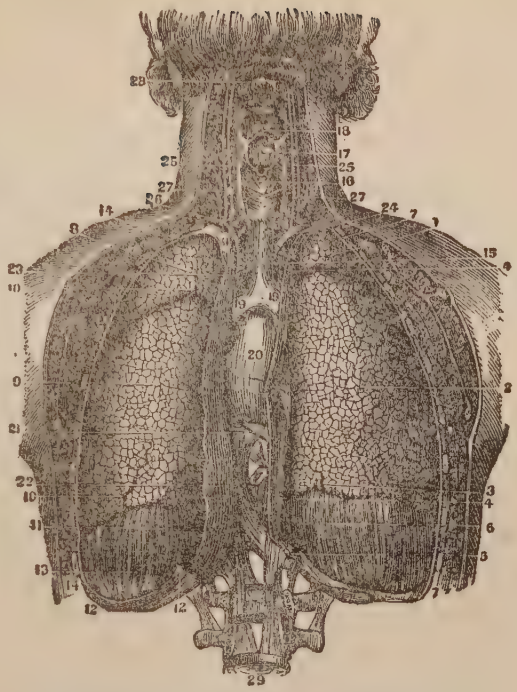
1 Superior Lobe of the Right Lung.
2. Its Middle Lobe.
3. Its Inferior Lobe.
4, 4. Lobular Fissures.
5, 5. Internal Layer of the Costal Pleura forming the Right Side of the Anterior Mediastinum.
6, 6. The Right Diaphragmatic Portion of the Pleura Costalis.
7, 7. The Right Pleura Costalis on the Ribs.
8. Superior Lobe of the Left Lung.
9. Its Inferior Lobe.
10, 10. Interlobular Fissures.
11. The Portion of the Pleura Costalis which forms the Left Side of the Anterior Mediastinum.
12. The Left Diaphragmatic Portion of the Pleura Costalis.
13. Left Pleura Costalis.
14, 14. The Middle Space between the Pleuræ, known as the Anterior Mediastinum.
15. The Pericardium.
16. Fibrous Partition over which the Pleuræ are reflected.
17. The Trachea.
18. Thyroid Gland.
19. Anterior Portion of the Thyroid Cartilage.
20. Primitive Carotid Artery.
21. Subclavian Vein.
22. Internal Jugular Vein.
23. Brachio-Cephalic Vein.
24. Abdominal Aorta.
25. Xiphoid Cartilage.

that one layer of the membrane is closely adherent to the lung, from which indeed it cannot be separated, while the other layer lines the inner surface of one half of the chest. These two layers form a closed cavity, the pleural cavity, which everywhere surrounds the lung except at the point where the bronchi and vessels enter it. This cavity is, in the natural state, a merely potential space, the two layers of pleural membrane being separated only by a thin layer of fluid, which enables them to glide with very little friction over one another, as the lung expands and retracts in breathing; but, in certain states, the fluid collects in the pleural cavity, so that pints or quarts of fluid may be effused there, compressing the lung.

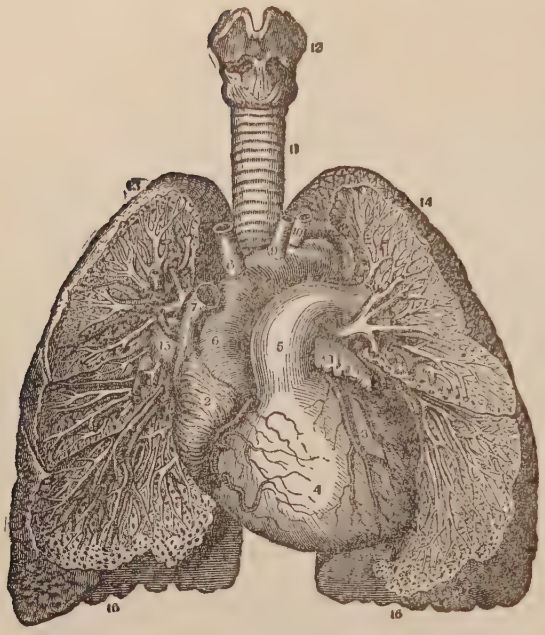
Color.—In children the color of the lungs is rose-pink, but as life advances they be-

come more and more of a slaty hue, mottled with streaks and patches of dark gray and black, which are due to deposits in the lymph spaces of dust inhaled on the breath. Esquimaux and others who live in an atmosphere free from dust retain the color of childhood, while, on the other hand, the lungs of coal-miners become often of a uniform jet-black shade.

Changes at Birth.—Prior to birth, and in still-born children, the lungs are of a yellowish color, of solid gland-like appearance, and packed away in the back of the chest. Further, such lungs do not float in water, and their weight amounts to about $\frac{1}{70}$ of the whole body-weight. Immediately upon birth a remarkable change takes place: the tissue of the lungs expands, like the petals of an opening flower; the color changes to rose-red,



1, 2. Upper and Lower Lobes of the Right Lung.
3. Interlobular Fissures.
4. Internal Portion of the Pleura Costalis, forming one of the Sides of the Posterior Mediastinum.
5. Twelfth Rib and Lesser Diaphragm.
6. Reflection of the Pleura over the Greater Muscle of the Diaphragm on the Right Side.
7, 7. Right Pleura Costalis adhering to the Ribs.
8, 9. The two Lobes of the Left Lung.
10, 10. Interlobular Fissures.
11, 11. The Left Pleura, forming the Parietes of the Posterior Mediastinum.
12, 13. Its Reflections over the Diaphragm on this side.
14, 14. The Left Pleura Costalis on the Parietes of the Chest.
15. The Trachea.
16. The Larynx.
17. Opening of the Larynx and the Epiglottis Cartilage in situ.
18. Root and Top of the Tongue.
19, 19. Right and Left Bronchia.
20. The Heart inclosed in the Pericardium.
21. Upper Portion of the Diaphragm on which it rests.
22. Section of the Esophagus.
23. Section of the Aorta.
24. Arteria Innominata.
25. Primitive Carotid Arteries.
26. The Subclavian Arteries.
27. Internal Jugular Veins.
28. Second Cervical Vertebra.
29. Fourth Lumbar.



A View of the Bronchia and Blood-Vessels of the Lungs as shown by Dissection, as well as the Relative Position of the Lungs to the Heart.

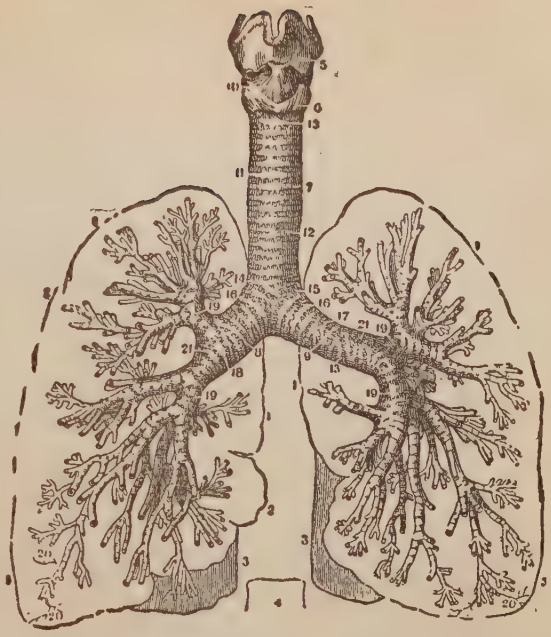
1. End of the Left Auricle of the Heart.
2. The Right Auricle.
3. The Left Ventricle with its Vessels.
4. The Right Ventricle with its Vessels.
5. The Pulmonary Artery.
6. Arch of the Aorta.
7. Superior Vena Cava.
8. Arteria Innominata.
9. Left Primitive Carotid Artery.
10. Left Subclavian Artery.
11. The Trachea.
12. The Larynx.
13. Upper Lobe of the Right Lung.
14. Upper Lobe of the Left Lung.
15. Trunk of the Right Pulmonary Artery.
16. Lower Lobes of the Lungs.

and the weight is suddenly doubled in consequence of the inrush of blood; the consistence becomes spongy, as air is drawn into the lungs, and if the child should die after drawing a few breaths, any portion of the lung which may be cut off floats in water. These changes are of immense importance, from the medico-legal point of view, in determining whether a dead infant has been born alive or not.

Connections with Heart.—Not only does the heart lie in contact with the two lungs, so that changes in the volume of the lungs cannot fail to have an effect upon the heart's action, but the heart is also connected by vessels with both lungs. The pulmonary artery passes from the right ventricle and divides into two branches, one of which runs straight outward to each lung, entering its substance along with the bronchial tube at the hilum, or root of the lung. From this point also emerge the pulmonary veins, which carry the blood purified in the lungs back to the left auricle.

Minute Structure.—The main bronchial tube, entering the lung at the root, divides into branches, which subdivide again and again, to be distributed all through the substance of the lung,

till the finest tubes, known as bronchioles, or capillary bronchi, have a width of only $\frac{1}{100}$ inch. In structure, all these tubes consist of a mucous membrane surrounded by a fibrous sheath. The windpipe, as well as the larger and medium bronchi, has in the fibrous layer large pieces of cartilage, which, in the windpipe and largest bronchial tubes, form regular hoops, and in the medium-sized tubes are disposed as irregular plates. These pieces of cartilage have the function of preventing the tubes from closing or being compressed, and so obstructing the passage of air. The larger and medium bronchi are richly supplied with glands secreting mucus, which is poured out upon the surface of the membrane.



THE LARYNX, TRACHEA AND BRONCHIA, DEPRIVED OF THEIR FIBROUS COVERING, AND WITH THE OUTLINE OF THE LUNGS.

1, 1. Outline of the Upper Lobes of the Lungs.
2. Outline of the Middle Lobe of the Right Lung.
3, 3. Outline of the Inferior Lobes of both Lungs.
4. Outline of the 9th Dorsal Vertebra, showing its relation to the Lungs and the Vertebral Column.
5. Thyroid Cartilage.
6. Cricoid Cartilage.
7. Trachea.
8. Right Bronchus.
9. Left Bronchus.
10. Crico-Thyroid Ligament.
11, 12. Rings of the Trachea.
13. First Ring of the Trachea.
14. Last Ring of the Trachea, which is Corset-shaped.
15, 16. A complete Bronchial Cartilaginous Ring.
17. One which is Bifurcated.
18. Double Bifurcated Bronchial Rings.
19, 19. Smaller Bronchial Rings.
20. Depressions for the Course of the large Blood-Vessels.

This surface is composed of columnar epithelial cells, which are provided with cilia, credited generally with the power of moving expectoration upward toward the throat, but probably designed simply to load the air passing into the lungs with warm moisture before it reaches these organs. The wall

of the bronchial tubes is very rich in fibers of elastic tissue, and immediately beneath the mucous membrane is a layer of circularly placed unstriped muscle fibers, which is specially well developed in the smaller bronchi. To this muscular layer probably is due the removal of expectoration, and it is certainly of great importance in connection with the causation of asthma.

The smallest divisions of the bronchial tubes open out into a number of dilatations, the infundibula, each measuring about $\frac{1}{20}$ inch in width, and these are covered with minute sacs, known as air-vesicles or alveoli. Each air-vesicle consists of a delicate membrane composed of flattened plate-like cells, strengthened by a wide network of elastic fibers, to which the great elasticity of the lung is due; and in these thin-walled air-cells the important function of the lungs is carried on.

The branches of the pulmonary artery accompany the bronchial tubes to the farthest recesses of the lung, dividing like the latter into finer and finer branches, and ending in a dense network of capillaries, which lies everywhere between the air-vesicles, the capillaries being so closely placed that they occupy a much greater area than the spaces between them. The air in the air-vesicles is separated, therefore, from the blood only by two delicate membranes, viz., the wall of the air-vesicle and the capillary wall, through which an exchange of gases readily takes place. The blood from the capillaries is collected by the pulmonary veins, which also accompany the bronchi to the root of the lung.

Another and much smaller set of bronchial blood-vessels runs actually upon the walls of the bronchial tubes, and these serve the purpose of nourishing the lung tissue.

There is in the lung also an important system of lymph-vessels, which commence in spaces situated between the air-vesicles, under the pleural membrane, and in the walls of the bronchial tubes. These vessels leave the lung along with the blood-vessels, and are connected with a chain of bronchial glands, lying near the end of the windpipe.

These lymph-vessels are important in that they do not allow the lung to pass all its poison to the blood. When these vessels become infected with the germ of tuberculosis, from the lung they carry it to all parts of the body. This gives rise to what is known as "galloping consumption."

TUBERCULOSIS, CONSUMPTION, OR PHTHISIS

Definition.—Consumption, or phthisis, is the popular name applied to a disease in which the chief outstanding and prevailing symptom is a rapid or gradual wasting away of the body, accompanied by fever, associated with loss of strength and enfeeblement of all the bodily functions, and following on a destructive change in one or more organs. The name consumption is a general term which is applied to the affection, regardless of the organ in which the destructive change which causes it occurs.

The term phthisis is usually confined to consumption which is the result of disease in the lungs, and which is technically known as pulmonary phthisis. The essential part of the disease is termed tuberculosis, and consists of tubercles which are formed in the substance of an organ. These tubercles are fine granules or minute particles, which are of a size that is barely visible to the naked eye, and they multiply and change in such a way as to cause ultimately the destruction of the organ in which they are found.

Tuberculosis not only affects the lungs, but may invade almost any organ; but it is seldom found in the muscles or in tissues that contain few blood-vessels, such as cartilage and sinews.

The fact that tuberculosis is rarely found in the muscles is indeed of considerable importance in preventing the disease. The severity of this malady varies to a very great extent, according to the organ that may be attacked. For example, tuberculosis of the bowels produces even more speedy consumption than the lung disease, while tuberculosis affecting the membranes of the brain and causing meningitis is almost always rapidly fatal. Chronic inflammation of bones and white-swelling of joints are also manifestations of tuberculosis, but they exercise less influence upon the general health. The enlargement of glands, most common in the neck, is a form of tuberculosis with which many persons are quite familiar.

Almost all chronic abscesses are of tubercular origin, and they arise from this malady in a bone, a gland, or the cellular tissue. The skin disease which is of so disfiguring a nature, and the name of which is lupus, is another manifestation of tuberculosis.

A tendency of this disease is to commence in one form, then to

affect other organs, though very likely in the great majority of cases the disease is limited to the organ which was originally attacked. There are many other maladies that bear a close resemblance to consumption, although they are quite distinct, such as cachexia, or diseased state of cancer; marasmus, or wasting away in children, due to bad feeding; and neurasthenia, the feebleness which results from bloodlessness, or anemia. Therefore the diagnosis is quite likely to be difficult sometimes, even for an experienced specialist or skilled expert.

Consumption has been recognized as a disease from the earliest times of recorded history. From 460 to 375 B.C. Hippocrates, the father of medicine, applied the name of phthisis to the disease as it affects the lungs, and descriptions of the conditions are found in the writings of classical authors, such as Laennec, who recognized that this and the various kindred conditions of other organs originated from the small tubercles, which are described hereafter. These were then supposed to be impurities from the blood. About the year 980 A.D., Haly Abbas of Bagdad, and again, in 1779, Cullen, recognized the infectious nature of phthisis, but it was not until after the middle of the nineteenth century that it was proved, by means of inoculating animals with tuberculous substances from patients affected with phthisis, that tuberculosis is really an infectious malady, and that the tubercles are engendered from a process of inflammation which is due to some poison that is introduced with the products of the disease.

There was considerable dispute as regards the nature of this poison until the year 1882, when Koch made an announcement of the discovery of the tubercle bacillus, or germ, and in that way the dispute was settled. There is no one who is considered reasonable and intelligent who doubts for a second that this bacillus is the primary and direct cause of tuberculosis, because the disease may be communicated to animals by means of inoculation; also by a pure culture of the bacilli, or germs, made on glycerine agar, which is a kind of glue or isinglass, and by the disease which is reproduced in other animals by inoculation of these bacilli, which are freed from all chance of contamination with any other substance. It is indeed interesting and important to the general reader to know how these germs are enabled to enter the body, and this access is possible by means of three channels:

First, by inoculation. A person may prick himself with a sharp instrument which is contaminated by the sputum of a patient who is affected with phthisis, or he may rub some of this sputum into a cut, where, however, the general result is only a skin affection. This accident occurs only in nurses, physicians, and other persons who are employed in hospitals for consumptives. Second, these bacilli may gain access to the body by inhalation. This is in all likelihood by far the most common channel. The sputum and other discharges from persons affected with phthisis are crowded with germs, and it has been computed that a person who is suffering from a cavity in the lung may spit up 4,000,000,000 germs in the course of twenty-four hours, and each of these bacilli, when dried and blown or carried about on dust, is capable of doing incalculable harm, for neither drying nor freezing, nor putrefaction, nor the lapse of many months avails in the destruction of these germs; and the reason why everybody does not become infected is to a very great extent due to the important fact that these bacilli cannot survive the influence of direct sunlight, for it is instantly deadly to them, therefore dust which has lain for a brief time in open air on a bright sunny day becomes rapidly innocent and perfectly harmless. In rooms in which phthisical patients dwell, also in the wards of hospitals, the dust from the floor very frequently contains tubercle germs which are capable of producing this disease when they have been inoculated into animals, but the germs cannot be found unless a person afflicted with consumption has recently occupied the room. This is because these germs do not multiply and increase except at the temperature of the body, although they can maintain their vitality and harmfulness in dry dust for many months.

It is evident, therefore, that the bacilli are propagated and spread only by consumptive patients, and they are not at all likely to be inhaled except in their immediate surroundings and vicinity. It is very likely that in almost all cases in which this disease affects the lung first the cause is the inhalation into the unhealthy lungs of germ-laden dust; while those cases in which the glands of the neck are first attacked result from the absorption of the bacilli through the tonsils. The latter fact becomes the more probable one, because it is found that in the kindred disease of scrofula in pigs those animals show quite unmistakably that this is the way infection actually occurred. The un-

usual importance of this manner of infection is shown by the fact that of the majority of persons who die of tubercular diseases the greatest percentage die from it as it affects the lungs.

The third way in which these bacilli may gain access to the body is by ingestion. It has been the belief for a long time that tuberculosis, like other infectious maladies, can be conveyed by means of milk and other articles of food; and, influenced by this belief, sanitary authorities have enforced regulations intended for the protection of the public, so far as possible, from the baneful effects of consuming diseased meat and milk. The vital and serious importance of this protective measure is that, according to the testimony of an eminent and experienced authority, about thirty per cent. of all cows are tubercular, while in two per cent. the udders are diseased, so that the milk of these cows almost of necessity becomes infected.

As regards meat, there is practically no danger, because, as stated above, the muscular tissues are free from the disease, and as the parts which are liable to be affected with the disease are carefully removed while the meat is being dressed, any accidental contact with them is rendered perfectly harmless by the cooking of the meat.

With respect to milk, however, it has been a matter of much earnest and serious dispute whether, on the one hand, the sale of milk obtained from cows with tuberculosis of the udders should be forbidden, or whether all milk should be sterilized before being used, so as to destroy the bacilli; or whether, on the other hand, such precautions are really necessary. The latter suggestion is that made by Koch in his statement before the British Congress of Tuberculosis held in London in the year 1901. He concluded that the tuberculosis which affects man and that which affects cattle are essentially different diseases, for very important differences are found between germs that are obtained from the two sources. The bacillus from the cow, when seen under the microscope, is shorter and thicker than the human bacillus; it does not grow so readily in cultures, and it is capable of producing acute tuberculosis when it has been infected into oxen or rabbits, which the human bacillus is scarcely ever known to do.

The Commission on Tuberculosis in its report which was issued in 1907, as well as several other observers, found that the bovine

bacillus, or germ from the cow, is present in a very large proportion of diseased glands in children. It has also been found that in tuberculosis which affects the bones and joints of children, from one third to one half are caused by the bovine bacillus. It is therefore warrantable to conclude that the tissues of healthy human adults are far more capable of successfully resisting the germ than the healthy tissues of children are, but that cattle tuberculosis is very liable to be, and often indeed is, communicated to children through milk.

The unavoidable result of this is that, for children, or for any who may be regarded as being liable to the disease, the precaution of sterilizing all milk should not be neglected, though this may not be absolutely necessary in the case of adults. Moreover, germs whose characters are intermediate between those of the bovine and the human types are found in birds and fish and even in grass and dust. They bear a very close resemblance to the two forms of tubercle bacilli, and when animals have been inoculated with them they produce local changes similar to tuberculosis. When tubercle germs have had access to an organ, whether by inhalation on dust or whether they have been absorbed from food and circulated through the lymphatics or blood-vessels, the following are the results which take place: There is an increase of the individual germs, and a minute tubercle or granule forms around each group. This tubercle or granule is of a size that is almost invisible to the naked eye and is grayish in color. These tubercles unite with neighboring ones and at the same time become soft, and the substance is of a cheesy consistency, so that it forms yellow bodies about the size of pin-heads. Each gray tubercle shows, when put under the microscope, the appearance of a group of cells of medium size, which are surrounded by many small leucocytes, or white blood-corpuscles, which are attracted to the spot as a result of the inflammation that is set up, and the tubercle germs are scattered among these cells. The larger yellow tubercles form a more or less structureless mass in the center, but they show numerous small gray tubercles around their edge, and in this way the process extends: the healthy tissue is broken down and gives place to the soft, cheesy mass, which, in the case of the lungs, ultimately bursts into a bronchial tube, is coughed up and leaves a ragged cavity in its place. There is another change which, however,

takes place at the same time, for, on account of the irritation which is caused by the tubercle, strands of fibrous tissue are built up around its edge, and where the process is a pronouncedly chronic one, these form a dense capsule for the tuberculous area and cut it off from further encroachment upon healthy tissue, and in this way nature effects a cure.

This disease being so common and wide-spread, its importance as it affects the welfare of the human race is likely to be disregarded and entirely overlooked. Mankind has become quite accustomed to a veritable scourge which actually decimates and carries off vast numbers every year, and in comparison with the great and amazing mortality caused by the terrible malady, the casualties caused by this most deadly plague seem to fall into insignificance and become almost negligible.

It is, however, a source of substantial encouragement and consolation to know that much is being increasingly done by sanitary science to reduce very substantially the inroads of the disease or to limit its attacks to those persons who are the least fit to survive. But, as prevention is always more successful than cure, the great factor which is urgently needed is that persons should be taught to become familiar with the nature of the disease and to adopt such measures as are necessary to ward it off. In spite of the marvelous advance in sanitary science in its efforts to check the inroads of the dread malady, its prevalence is very great and continues to be a cause of considerable anxiety and effort to combat it and curb its ravages. While one person in seven or thereabouts of the whole human race dies of some form of tuberculosis, it is computed, and the computation is corroborated by autopsies, that one person in every three suffers from incipient consumption of the lungs at some period of life.

It is reasonable to conclude, from what has already been stated, that the direct cause of consumption, or phthisis, is the tubercle germ which was discovered by Koch; but owing to the fact that many persons suffer from this malady in a mild degree and afterward recover, and that many limited cases of tuberculosis in bones, skin glands, and other allied parts are treated successfully, it does seem that there are many other factors which determine whether any particular case is grave or not, and whether it is likely to continue toward recovery if suitably and properly treated, or to end fatally.

Next to the principle of infectiousness, perhaps heredity takes first rank as being the most important factor predisposing one to the affection. As to how heredity acts, many theories have been advanced. It is almost untenable to hold that the disease is transmitted direct from either parent prior to birth, except, perhaps, in an occasional case. An explanation which is more likely to be accepted, because it contains a greater probability of accuracy, is that some peculiarity in the chemistry of the body, or some defect in the formation of the lung or chest, is transmitted or handed down, so as to render successive members of one family more easily affected by the tubercle germs than those of others; but the very important fact must not be forgotten, that, however bad a heredity may be, its harmful effects may be neutralized by proper care of the health and by regular, careful, and proper living.

A point of considerable importance is age. As has been stated above, young children are liable to have the bowels, and glands connected with them, affected by tuberculosis. At a slightly later age, there is a greater tendency to that type of the disease which was formerly known as scrofula, in which the glands of the neck are particularly affected; and the greatest number of deaths from consumption in the lungs takes place after the age of twenty-five.

It is highly important to note, in connection with the comparative liability of the two sexes to attacks of this disease, that it used to be thought that women were more liable to consumption than men, but this holds good only up to the age of twenty-five, and after that age the proportion is only about three deaths among women to every four among men from tubercular diseases of every kind.

Another factor of considerable importance which determines the liability of persons to this disease is occupation. Persons whose lives are easy and luxurious, with good food and little worry and anxiety, suffer much less than the hard, laborious workers with hand or brain, or those whose fare is stinted and inadequate. This is exemplified in the experience of a distinguished physician, who has stated that while the proportion of deaths from phthisis of those living on their means was only fifty in one thousand, the deaths from this cause over and above all classes were one hundred and fourteen in one thousand. In

other words, persons whose means are small and in whom there is a steady and constant output of energy and loss of tissue without adequate and proper nourishment to keep up and preserve the balance of waste and repair are more liable to this disease, under ordinary conditions of physical structure and constitution, than those who are more fortunately circumstanced.

Further, it is not at all uncommon that a person suffers from consumption and recovers apparently; then, on the occurrence of some reverse of fortune or some domestic trouble, the disease reappears and he succumbs rapidly.

The condition of the atmosphere is also a factor to be reckoned with in connection with this malady. The character of the atmosphere in which work is performed plays a very important part in the attacks of phthisis. Persons who make it a habit to live and work in ill ventilated rooms are at a considerable disadvantage, as compared with those who lead an open-air life, or, at any rate, keep their rooms well and thoroughly ventilated. For that special reason it has been generally observed that soldiers, sailors, and convicts are much less liable to contract this disease than men of the same classes who live and work in surroundings that are not sanitary and hygienic. The nature and quantity of the dust in the air is also a very important factor, as, for example, there are comparatively few deaths from phthisis among agricultural laborers, but there are about twice as many among wool-workers, carpet-makers, and masons. There are about three times as many among iron, steel, and copper workers, scissors-grinders, and file-makers; the average number of deaths from this disease is about four times as many as among agricultural laborers.

It is a fact, however, which is worthy of note, that the mortality among coal-miners, whose lungs are actually black from the coal-dust inhaled, is far less than it is among men who work in the open air. This appreciable difference may be accounted for by the theory that there is some protective influence either in the coal dust or the nature of the work.

It was formerly believed that certain occupations, by means of which persons were brought into contact with the flesh or hides of animals, gave those engaged in such occupations freedom from liability to phthisis, as, for example, tanners, stablemen, and butchers. It was quite common among consumptives in

certain parts of Europe, very many years ago, to seek an abode above a cow-house, in the hope of getting rid of their ailment. There are also other diseases of considerable importance that bear some appreciable relation to phthisis, as, for example, a person who has long been a sufferer from asthma or bronchitis is more than likely to develop consumption ultimately, and those who are affected with diabetes contract this disease so commonly that it is considered to be one of the natural ways in which a person suffering from diabetes meets his death. It must not be forgotten, also, that severe diseases of the lungs bear a very close relation to consumption, such as chronic catarrh, which results from a simple cold, chronic bronchitis, pneumonia, or potter's lung in potters, caused by inhaling dust, which destroys the lung tissue to a great extent, as real phthisis does. The difference between these and true phthisis consists in the fact that the general symptoms they produce are not at all so severe as those of phthisis proper, namely, fever, night-sweats, and wasting. They are also more amenable to palliative and curative treatment. They are, however, often very hard to distinguish from true phthisis, though the tubercle bacillus can never be found in the expectoration unless true phthisis should graft itself upon the original malady. This is more than likely to be the case.

VARIETIES

The various forms of tuberculosis besides consumption of the lung, such as tubercular disease of joints and bones, meningitis, lupus, and other kindred types, are embraced among the varieties. There are, however, several varieties of the lung disease itself, and they differ very much one from another.

Acute Miliary Tuberculosis is one of these varieties. In this form of the disease, not only the lungs but the entire body becomes dotted with the tubercles of the disease, which are distributed by the blood, and the patient dies in two or three weeks from fever and exhaustion. This is the most rapid form in its development and termination, and with the second variety is popularly known as "galloping consumption."

Acute Caseous Tuberculosis is a slightly slower form, only the lungs being affected, and either because the bacilli, which are

inhaled in the lungs, are more especially virulent or poisonous, or, which is more likely, because the person is in an unusually weak condition or of an unhealthy constitution, tubercles form, undergo the cheese-like change and break down, so as to form cavities very rapidly. The patient dies in two or three months.

Fibro-caseous Tuberculosis.—This is the usual type, and lasts for years. The change which the lung undergoes is very much like that which takes place in the last-mentioned form, but in addition to and on account of greater power of resistance in the patient, nature makes an effort to effect a cure spontaneously, and a great deal of fibrous tissue is formed as a result. The lung becomes denser, cavities gradually form in various spots, and the downward progress is slow, or it may be checked.

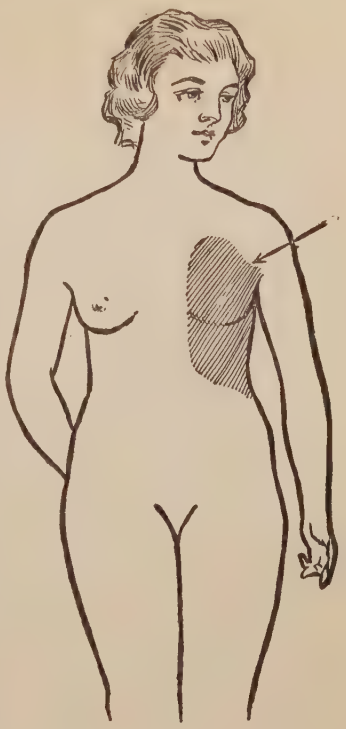
Fibroid tuberculosis is very seldom found to affect a large area of the lung. In this form, areas of the lung are converted into fibrous masses, which are really scars of previous disease that has been cured by Nature herself, and there are no cavities. That is to say, if Nature's unassisted cure is to be complete and thorough, it can be effected only at an early stage of the disease.

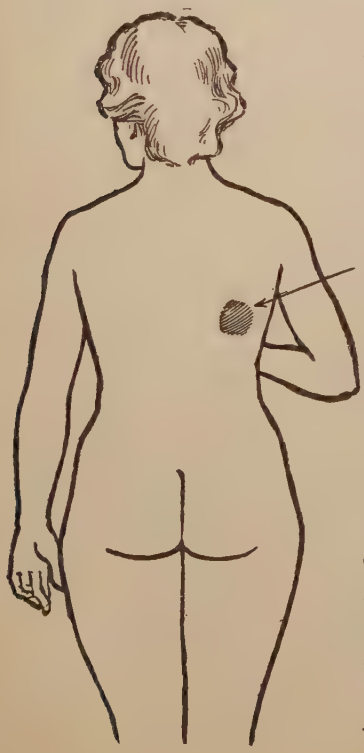
Symptoms.—It may be assumed that symptoms of consumption are more or less generally known, as there are comparatively few persons who have not had a fair opportunity to observe the disease in some relative or friend. The symptoms fall into three stages of the disease.

The Early Stage.—In the early stage of this malady the tubercles are being deposited in the lung, almost always at the apex in the root of the neck, and consequently this part of the lung becomes more solid. There is an irritative cough, especially in the morning, either without any expectoration or accompanied by a small quantity of clear mucus. The spitting up of blood sometimes is the very first sign, but this is never in large quantity at the early stage. It is caused by congestion, which the irritation of the tubercles produces.

From the very beginning there is loss of appetite, color, and strength, and these are soon followed by emaciation and loss of weight, and the slightest exertion causes perspiration. Night-sweats are very often one of the symptoms. A regular rise in the temperature of the body is also a very important sign, and

this may occur either in the forenoon, or oftener early in the afternoon, with a fall to below normal in the morning. This, however, is by no means an invariable symptom of consumption. There is usually derangement of the functions of digestion, and vomiting, diarrhea, or constipation is likely to be present. Very often a slight attack of pleurisy, causing pain in the chest, as indicated by the shaded area in the accompanying illustration, serves as a forerunner of this disease, or it may accompany these symptoms. Particular attention should be given to this stage of this terrible scourge, for it is at this point that it yields to proper treatment quite readily and a cure is effected. Thus it can be readily seen that it is very important that anyone who has had a recent attack of phthisis and is affected as above described should be prompt in seeking medical assistance.





Advancing Stage.—At this advancing stage of the disease the tubercles have united to form cheesy masses, and these are breaking down and being expectorated, leaving a ragged cavity, while the disease is advancing slowly to new areas of the lung, with occasional pain, as shown by the shaded area in the accompanying figure; sooner or later the surface of the cavity becomes infected with other germs that are inhaled on dust, and these keep up the process of ulceration

which is going on on the surface of the cavity and prevent it from healing.

The symptoms are chiefly an addition to those that were present at the first stage. The cough is at this stage more annoying, and the expectoration, which is thick and yellow, contains numerous tubercle germs. It can be strained and examined under the microscope, and is occasionally streaked with blood. The patient is much weaker and suffers great loss of weight. The temperature varies, rising to 100° to 101° F. late in the afternoon, but falling considerably below normal in the early part of the day. Profuse night-sweats are very likely to occur during sleep in the early hours of the morning, and attacks of vomiting and diarrhea are of frequent occurrence. The affection is likely to extend to the other lung at this stage. It may also spread to other organs, such as the throat or intestine, with which the sputum comes into contact. The falling in of the chest over the excavated area, which causes a flat place or depression in its upper part, is also a very important sign. Recovery occurs occasionally at this stage, but if the disease should advance so far without being properly treated, a perfect cure is an utter impossibility.

Late Stage.—In this stage of the disease there are usually large cavities that have formed in the lung, or there has been a production of fibrous tissue, as the lung has shrunk and consists of a mass of matted fibrous tissue and smaller cavities, so that the whole side has fallen to a considerable degree. Very often the voice is lost, owing to disease in the throat, or there is troublesome diarrhea, which is due to affection of the bowels. Hemorrhage being common in this stage, death may result from it. There is also swelling about the feet, and other signs of gradual failure of the heart. The emaciation is in this stage very pronounced and extreme, and bed-sores are very likely to form. The varying temperature and the profuse sweats continue unabated, and the cough is often of a very annoying nature.

Throughout the disease there is a peculiar mental state known as the hope of the consumptive. By means of this hope the victim of this dread complaint is sustained and buoyed up by the daily returning belief that he is better and that his recovery has commenced. The duration of this illness varies considerably,

according to the food with which the patient is nursed. Among the poorer classes a case may continue less than a year, while the average duration of cases which become worse steadily and by degrees is between one and three years.

Treatment.—The treatment of this disease falls, as a matter of course, into two classes, namely, the preventive and the curative or remedial. Among the preventive measures against consumption, the selection of a suitable occupation is a matter that is entitled to very serious and thoughtful consideration, as the effect of such a vocation on the health of the individual must be far-reaching. The selection of a peculiarly suitable vocation is likely to tend very often to perfect health, or at least to the prolonging of life for several years; but, on the other hand, the choice of an unsuitable calling will soon awaken the lurking and slumbering disease to an activity that may result in detriment and destruction, and ultimately bring the life of the person affected to a premature end. Individuals with weak chests, even though they may not be disposed to phthisis, are not fit for occupations in closed and ill ventilated rooms in which they are exposed to foul air and irritating dust, gases, or vapors, or in places where they may be obliged to handle poisonous substances.

People who have a tendency to tuberculosis should adopt an open-air mode of life, especially in fields or parks. In order to limit the spread of phthisis, the sputum must be given special attention. As a primary step, it is necessary that all persons who are affected with cough should be strictly cautioned not to expectorate carelessly on the floor or into a handkerchief, and a cuspidor should be used in the house for the purpose of expectorating. For outside use, it is advisable to carry a wide-mouthed flask which may be conveniently carried in the pocket.

Strict and careful supervision should be exercised over dairies and dairy farms, and special attention should be paid to the condition of the animals. There should be strict segregation of all cows that are affected with inflammation of the udders, and the milk of such animals should not be drunk. If there be unmistakable evidence of tuberculosis of the udders, the animal should be killed and the owner adequately indemnified.

As a further preventive measure, the dwellings of all persons who have died of phthisis should be thoroughly disinfected, and

lodging-houses, ships' cabins, railroad cars, prison cells, and other places that have been occupied by consumptives should, in like manner, be carefully and thoroughly disinfected.

A great deal has been said and written on the subject of the intermarriage of persons with a bad family history, and in view of what has been stated above it is not possible to doubt that the children of persons who have died of phthisis, or of persons who have a strong and pronounced heredity of phthisis, are more or less liable to the disease, so that it is not advisable for a person who is actually suffering from consumption to marry and beget children, or for two persons, each of a stock that is pronouncedly consumptive, to marry, even though they are both in good health at the time of the intended marriage. Children who are known to have tubercular complaint should live a more guarded and cautious life than usual, and should be well fed, be made to take proper and sufficient exercise, and be well protected from infection. In regard to such children, it is a very wise and necessary precaution to sterilize all milk and cream that they are to consume.

Delicate persons, particularly those who are affected with any lung trouble whatever, and those who have just recovered from disease, should avoid coming into contact with persons who are suffering from phthisis. Persons whose chests are poorly developed should endeavor to remedy this defect, and those who are liable to attacks of bronchitis, general catarrh, and such maladies should adopt measures such as cold baths, athletic exercises, and similar means to strengthen and harden the body and increase their powers of resistance.

A great deal has been done by those in public authority to bring about the proper ventilation of work-rooms, to prevent overcrowding in the homes of the very poor, and to better the housing of the working-classes. These measures have had the beneficent effect of educating the masses in healthy habits. Thus a great and important step has been taken toward checking the spread of tubercular infection, and it is very gratifying to know that public authorities have so thoroughly realized the alarming danger of this disease, by the continued ravages it has been steadily making in the population of both hemispheres. Still more effective measures are being taken now by many authorities on sanitation to restrict the sweep of the disease by re-

quiring to be notified of all cases of phthisis, in large towns especially. They visit them and provide those who are suffering directly with the necessary means of disinfection, and, moreover, prohibit persons who are suffering from the advanced stage of consumption from working in bakeries, candy stores, and kindred places, where their presence tends to imperil the health and safety of the public.

It is worthy of note, however, that spitting on the open ground is comparatively harmless, for the reason that the action of the sunlight, which is a potent destroyer of germs, is deadly to any germs that the expectorated substance may contain. It is a very necessary precaution that all persons suffering from phthisis should carry with them a sputum-flask, in which a small quantity of five-per-cent. carbolic acid solution, which sterilizes the sputum quickly, has been placed. This sputum-flask should be either emptied in a drain once a day, or destroyed by fire, and indeed it is a necessary and a very wise precaution that all other discharges from consumptives should be treated in the same manner, i.e., mixing them thoroughly with a solution of carbolic acid.

It must not be forgotten that persons who are in attendance on consumptives should never partake of food in the sick-room, and should never eat without first having washed the hands very carefully, for by means of this precaution there is less risk to relatives and others who may come into contact with patients affected with phthisis.

Further, persons who are known to be liable to phthisis should avoid such occupations or employments as are carried on in a close or dusty atmosphere, and especially if the dust should be of a gritty character, such as the dust of masons and glass-grinders, and they should never neglect to have their dwellings thoroughly ventilated, both by night and day.

Remedial or Curative Treatment.—In attempting to employ either curative or palliative measures, it must be borne in mind that many so-called cures for consumption are being sold by unprincipled persons, but that from what has been so clearly and lucidly stated with respect to the condition of the lungs in advanced cases, even to check the progress and inroads of the disease after it has reached the advanced stage is almost out of the question, for even if all of the tubercle germs should be utterly

destroyed, the lung is left with numerous cavities or openings with ulcerated surfaces. These cavities can only be closed up through the falling in of the walls of the chest, so that even in the most favorable of advanced cases the sufferer is left a permanent invalid with hollow chest and feeble lungs, in which the disease is likely to spring up again.

The tuberculin introduced by Koch excited very great interest on account of its possibilities; its use, nevertheless, proved a disappointment at first. However, there has been a recent revival, in a more cautious manner, of the tuberculin of Koch and others. The stimulation of the healing process is especially suited to cases in the early stage, which respond to other measures, too. It is well to remember that advanced cases are frequently made worse by the use of tuberculin. A change of air is highly beneficial in early cases, and sea voyages, mountain air, or another dry climate will be found best for different classes of cases. In certain cases, a dry climate, if the patient be treated with due prudence, may effect a perfect cure. Whenever any of these is impossible, the sufferer should pass his nights in a large, well ventilated bedroom, and during the day he should employ the whole time in walking, sitting, or lying in the open air. He should, of course, be protected by a veranda from rain and wind.

After the patient has become sufficiently hardened he is likely to derive considerable benefit by sleeping in the open air, but he must, of course, be adequately protected from the dew and the wind. This exposure to air and sunshine is wholesome, and not only acts as a cure in early cases, but in advanced cases that are hopeless it improves the comfort of the patient to a considerable degree by raising his spirits, sharpening his appetite, and subduing the fever which lowers his strength so much and shortens his life.

The clothing of the patient must be invariably warm, and wool ought always to be worn next to the skin. The sufferer while lying in the open air must be carefully and properly wrapped up, and special care must be taken to keep the hands and feet warm, owing to the fact that he is more or less liable to catarrh, by which the spread of the disease is favored and promoted.

The following daily routine of a sanitarium is strongly recommended, and if adopted and carried out strictly and faithfully

will be found to produce highly satisfactory and beneficial results:

5.15 A.M. Wake patient; sponge back and chest with cold water and dry same quickly.
7.00 A.M. Patient arises.
7.30 A.M. Breakfast, consisting of coffee, rolls, honey and butter.
8.00 A.M. Visit of physician in bedroom.
8.30 A.M. Patient goes out in open air if strong enough, and if weather should permit, must walk slowly, practising taking a deep breath at every sixth step.
9.30 A.M. Second breakfast of warm milk, bread and butter.
10.00 A.M. Patient goes out on porch, where he lies quietly for two hours.
12.30 P.M. Dinner, consisting of soup, fish, two or three courses of meat, pastry or pudding, and milk.
1.30 P.M. Patient goes out on porch again, where he lies quietly for two hours and a half. He must neither read nor write.
4.00 P.M. Afternoon meal, consisting of milk or cocoa, with cold meat or eggs.
4.30 P.M. Patient walks slowly in open air for one hour and a half, if strong enough, practising the taking of deep breaths, as in the morning.
6.00 P.M. Visit of physician in bedroom.
6.30 P.M. Patient lies out on porch for one hour.
7.30 P.M. Supper, consisting of two courses of meat with vegetables and hot milk.
9.30 P.M. Patient retires for the night.
10.00 P.M. Back and chest to be sponged and dried, as in the morning.

The patient must be carefully examined and weighed once a week, and must have a warm bath once a week also, but convalescent patients must take a daily cold shower-bath and must be made to take a walk immediately afterward. Undue exercise, such as running or games that involve the expenditure of much energy, must, however, be avoided, as they tend to induce hemorrhage; but the milder games or sports, like riding or golf, and

in weaker cases walking or dumbbell exercises, are of considerable benefit.

It must be borne in mind that the amount of exercise which may be taken depends, for the most part, on the nature of the individual case. The important fact must not be forgotten that diet is one of the essential features of treatment, and the food must be not only of good quality but the quantity must be as large or larger than that which is taken during normal health, even though the sufferer does not exert himself to any considerable extent. The patient must be given three or four ounces of fat, which is absolutely necessary, and this may be in the form of butter, cod-liver oil, cream, salad dressing, or other soft fat, and should be taken daily in addition to that contained in the ordinary diet. The food which is perhaps of most value to the consumptive is milk, and if the patient is able to take it a daily consumption of six tumblerfuls is not at all too much. Various artificial foods may be added to it, such as malted milk, or a beaten egg, so as to improve its taste. When the patient has become weary of cow's milk, some of the artificial brands may be tried with benefit. As stimulants, meat juices are very good, but they must not be allowed to take the place of nutritious food, and it is well to remember that care must be taken not to feed the patient beyond the safe limits of his powers of digestion; and if dyspepsia or diarrhea should set in, no time must be lost in lessening the quantity of food.

In the early stages alcoholic stimulants must, as a rule, be avoided; but in the later stages, when it is not possible to arrest the fever and when the sufferer has spells of exhaustion, they are undoubtedly quite necessary and beneficial. Red or white wines of the weaker brands, if taken at meal-times, and whisky or brandy well diluted, if taken between meals and especially at evening, are highly valuable.

As regards medicines, they are administered for many purposes in this malady. In the early stages much use is made of tonics and substances such as bitters, which stimulate the appetite. The foremost remedy is, however, cod-liver oil, either the plain or the emulsion form, and when it has disagreed petroleum emulsion is then substituted. When there are pains in the side from pleurisy, relief is afforded by painting with iodine or strapping with belladonna plaster. A complication which is

very annoying and irritating is sweating, and in the early stages the open-air treatment affords considerable relief. When it has come on later, however, it is due in part to weakness and in part to loss of tone in the blood-vessels, and where it results from weakness it is materially diminished by the use of stimulants or a little easily digested food if taken just before sleep; and in case it should arise from loss of tone in the blood-vessels, it is lessened by the use of oxide of zinc, extract of belladonna, and picrotoxine.

Diarrhea is due to various causes, namely, to simple weakness, to imprudence in diet, and to waxy degeneration of the blood-vessels in the walls of the bowels, which allows too much food to transude or ooze out. In the latest stage of the disease it is the result of tubercular ulceration. They are all to be treated by changing the diet, by astringents, and by opiates. When diarrhea is caused by ulceration the condition is one of considerable gravity. When the diarrhea is persistent and obstinate and is a source of annoyance to the patient, considerable benefit is derived from the administration of half a grain of sulphate of copper, or one quarter of a grain of nitrate of silver three times a day.

PNEUMONIA—INFLAMMATION OF THE LUNGS

Definition.—This is an inflammation of the substance of the lungs, sometimes called lung fever. It is very apt to be complicated with pleurisy or bronchitis. Pneumonia may be either single or double; that is, one lung may be affected, or both. It is more common upon the right side than upon the left.

Causes.—Exposure to cold or wet seems to be generally the exciting cause of an attack of pneumonia, though other conditions are also important. Often the person affected is run down in health, fatigued, or mentally depressed, though the disease, and particularly when associated with influenza, frequently attacks the most robust with rapidly fatal effect. The actual cause of the inflammation appears, in most cases, to be the *Diplococcus pneumoniæ* discovered by Fraenkel, though the conditions under which this organism flourishes and produces infection are not clearly understood. Though not infectious in ordinary circumstances, there are numerous instances on record

in which the disease has appeared to spread as an epidemic in localities or in families in such a way as to suggest that it is directly infectious from person to person.

Symptoms.—Inflammation of the lungs comes on with a pain in the chest or side (see figure with Treatment), great difficulty of breathing (particularly in a recumbent position or when lying on the side affected), together with a cough, dryness of the skin, heat, anxiety, and thirst. At the commencement of the disease the pulse is usually full, strong, hard, and frequent, but in the more advanced stage is commonly weak, soft, and often irregular. In the beginning the cough is frequently dry and without expectoration, though in some cases it is moist even from the first, while the matter expectorated is various both in color and consistence, being often streaked with blood.

If relief is not afforded in time and the inflammation proceeds with such violence as to produce suffocation, the vessels of the neck will become swollen, the face alter to a purple color, and an effusion of blood will take place into the cellular substance of the lungs, which impedes the circulation through that organ.

If these violent symptoms do not arise and the proper means of subduing the inflammation have either been neglected or have proved ineffectual, although adopted at an early period of the disease, a suppuration may ensue, which event may be recognized by frequent slight shiverings, an abatement of the pain, and sense of fullness in the part, while the patient is able to lie on the side that was affected without experiencing great uneasiness.

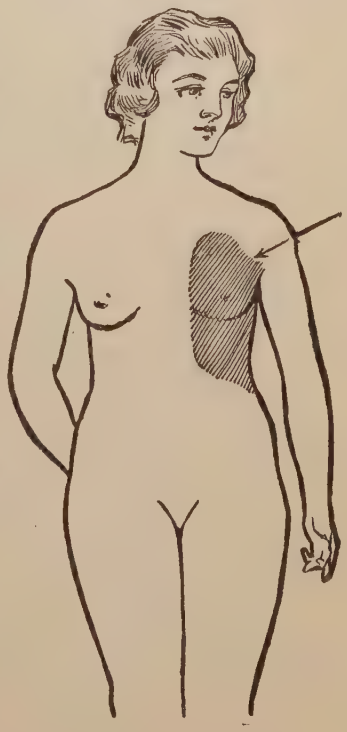
When pneumonia proves fatal, it is generally by an effusion of blood occurring in the cellular texture of the lungs, occasioning suffocation. This usually happens between the third and seventh days. Pneumonia may likewise prove fatal by terminating either in suppuration or gangrene.

When it goes off by resolution, some very evident evacuation always attends it; i.e., a great flow of urine with a copious sediment, diarrhea, a sweat diffused over the whole body, or a hemorrhage from the nose. However, the evacuation which most frequently terminates the complaint with greatest effect is a free and copious expectoration of a thick white or yellow matter, slightly streaked with blood. By this the disease is carried off, generally in the course of ten or twelve days.

Treatment.—The first thing to be given is an emetic of tartar or ipecac. This should be followed by a purgative; Epsom salts or citrate of magnesia will answer the purpose. Tincture of aconite may be given to produce sweating (dose, one drop every hour), and hot-water bottles should be applied to the sides and around the body at the same time. If the fever is high and the pulse rapid, it is better to promote sweating by using the tincture of veratrum viride in doses of from three to ten drops every hour. Wine of ipecac may be given in doses of twenty drops every two or three hours in a tablespoonful of water, or the following:

℞ Nitrate of Potassa two drams
Gum Arabic, or White Sugar two drams
Mix.

A mustard plaster should be applied over the shaded area indicated on the figure. The proper way to apply a mustard poultice to prevent its blistering, is first to bathe the affected part with olive or castor oil; then apply the poultice spread on gauze or lint, as hot as possible, cover with absorbent cotton, and bandage. After the poultice is removed, the chest should be strapped with adhesive plaster. A piece of plaster about fifteen inches long and three inches wide is pulled tightly around the chest over the affected area.



For the cough, after the fever has subsided, the following may be used:

℞ Syrup of Tolu ... one ounce
Syrup of Squill... one-half ounce
Wine of Ipecac .. two drams
Mucilage of Gum Arabic
one and one-half ounces
Mix.
Dose: One teaspoonful occasionally.

Should the patient be feeble and low when the fever is gone, the following should be used:

℞ Bicarbonate of Soda one-half ounce
Compound Infusion of Gentian.....four drams
Tincture of Calumba one ounce
Syrup of Orange Peel one ounce
Mix.
Dose: One tablespoonful three times a day.

Or:

℞ Muriated Tincture of Iron one ounce
Rose-water six ounces
Syrup of Orange Peel one ounce
Mix.
Dose: One teaspoonful in a wineglass of water, after each meal.

In the treatment of typhoid pneumonia, the following may be used:

℞ Acetate of Potassa.....five and one-half drams
Sweet Spirits of Niter.....two drams
Directions: Water enough to make eight ounces; dissolve and take a tablespoonful every three or four hours.

The following is an excellent tonic:

℞ Carbonate of Iron one dram
Pulverized Rhubarb one-half dram
Pulverized Aloes one-half dram
Extract of Hops one-half dram
Mix and make into thirty pills.
Dose: One pill three times a day.

Or:

℞ Quinine twenty grains
Dilute Sulphuric Acid one dram
Alcohol four ounces
Mix.
Dose: One teaspoonful three times a day.

The cough should be kept loose by drinking freely of flaxseed, slippery elm, or marshmallow tea, at the same time using a plaster on the chest.

Diet.—Until the crisis is passed and the patient on the way to recovery, the diet should consist of milk and beef juices. About the seventh day, orange juice in teaspoonful doses, six to eight times a day, is beneficial. When the fever has subsided, crackers and toast may be added. After the ninth day, broiled meats in small amounts, together with starchy foods such as rice, tapioca, arrowroot, corn-starch and potatoes, are allowed.

BRONCHITIS

Definition.—Bronchitis is an inflammation of the mucous membrane of the bronchial tubes. Well known as one of the most common diseases. bronchitis exists in either an *acute* or a *chronic* form.

Acute Bronchitis, like other inflammatory affections of the chest, generally arises as the result of exposure to cold, particularly if accompanied with damp, or of sudden change from a heated to a cool atmosphere. It may also arise as the result of inhaling irritating dust or vapors.

Symptoms.—The symptoms vary according to the severity of the attack, and more especially according to the extent to which the inflammatory action spreads in the bronchial tubes. The disease usually manifests itself at first in the form of a catarrh, or common cold; but the accompanying feverishness and general constitutional disturbance proclaim the attack to be something more severe, and symptoms denoting the onset of bronchitis soon present themselves. A short, painful, dry cough, accompanied with rapid and wheezing respiration, a feeling of rawness and pain in the throat and behind the breast-bone, and of oppression or tightness throughout the chest, mark the early stages of the disease. In some cases, from the first, symptoms of the form of asthma known as the *bronchitic* are superadded, and greatly aggravate the patient's suffering.

After a few days, expectoration begins to come with the cough, at first scanty and viscid or frothy, but soon becoming copious and of purulent character. In general, after free expectoration has been established the more urgent and painful symptoms abate; and, while the cough may persist for a length of time, often extending to three or four weeks, in the majority of instances convalescence advances, and the patient is ultimately

restored to health, although there is not infrequently left a tendency to a recurrence of the disease on exposure to its exciting causes.

The case is, however, very different when the inflammation spreads into or when it primarily affects the minute ramifications of the bronchial tubes which are in immediate relation to the air-cells of the lungs, giving rise to that form of the disease known as *capillary bronchitis*. When this takes place all the symptoms already detailed become greatly intensified, and the patient's life is placed in imminent peril in consequence of the interruption to the entrance of air into the lungs, and thus to the due aeration of the blood. The feverishness and restlessness increase, the cough becomes incessant, the respiration extremely rapid and labored, the nostrils dilating with each effort, and evidence of impending suffocation appears. The surface of the body is pale or dusky, the lips are livid, while breathing becomes increasingly difficult, and is attended with suffocative paroxysms which render the recumbent posture impossible. Unless speedy relief is obtained by coughing and expectoration, the patient's strength gives way, somnolence and delirium set in, and death ensues. All this may be brought about in the space of a few days, and such cases, particularly among the very young, sometimes prove fatal within forty-eight hours.

Acute bronchitis must at all times be looked upon as a severe and even serious ailment, but there are certain circumstances under which its occurrence is a matter of special anxiety to the physician. It is preëminently dangerous at the extremes of life, and mortality statistics show it to be one of the most fatal of the diseases of those periods. This is to be explained not only by the well recognized fact that all acute diseases tell with great severity on the feeble frames alike of infants and aged people, but more particularly by the tendency which bronchitis undoubtedly has, in them, to assume the capillary form, and when it does so to prove quickly fatal. The importance, therefore, of giving early attention to the slightest evidence of a case of bronchitis among the very young or the aged can scarcely be overrated.

Bronchitis is also apt to be very severe when it occurs in persons who are addicted to intemperance. Again, in those who suffer from any disease affecting directly or indirectly the re-

spiratory functions, such as consumption or heart disease, the supervention of an attack of acute bronchitis is an alarming complication, increasing, as it necessarily does, the embarrassment of breathing. The same remark is applicable to those numerous instances of its occurrence in children who are, or have been, suffering from such diseases as have always associated with them a certain degree of bronchial irritation, such as measles and whooping-cough.

One other source of danger of a special character in bronchitis remains to be mentioned, viz., collapse of the lung. Occasionally a branch of a bronchial tube becomes plugged up with secretion, so that the area of the lung to which this branch brings air ceases to be inflated on inspiration. The small quantity of air imprisoned in the portion of lung gradually escapes, but no fresh air enters, and the part collapses and becomes of solid consistence. Increased difficulty of breathing is the result, and where a large portion of lung is affected by the plugging up of a large bronchus, a fatal result may rapidly follow, the danger being specially great in the case of children. Fortunately, the obstruction may sometimes be removed by vigorous coughing, and relief is then obtained.

Treatment.—With respect to the treatment of acute bronchitis, in those mild cases which are more of the nature of a simple catarrh little else will be found necessary than confinement in a warm room, or in bed, for a few days, and the use of light diet, together with warm diluent drinks, warm milk being specially beneficial. Additional measures are, however, called for when the disease is more markedly developed. Medicines to allay fever and promote perspiration, such as the well-known Mindererus spirit, combined with antimonial or ipecacuanha wine, are highly serviceable in the earlier stages. Later on, with the view of soothing the pain of the cough and favoring expectoration, mixtures containing squill or tolu, with the addition of some opiate, such as the ordinary paregorics, may be advantageously employed. The use of opium, however, in any form should not be resorted to in the case of young children without medical advice, since its action on them is much more potent and less under control than it is in adults. Not a few of the so-called "soothing mixtures" have been found to contain opium in quantity sufficient to prove dangerous when administered to children; and, in-

deed, it is to be feared that fatal results not infrequently follow their incautious use in this way.

From the outset of the attack the employment of warm applications to the chest in the form of fomentations or poultices affords great relief. Few remedial measures are of greater value than the frequent inhalation of steam. This is accomplished readily enough in the case of adults by the use of an inhaler or simply by breathing over an open-mouthed vessel containing boiling water. In children, in whom this plan cannot be carried out in the same manner, there is in general no difficulty in surrounding them with an atmosphere of steam by placing around them vessels containing hot water, the vapor from which envelops them, or by erecting over the bed or cot a tent, formed by a screen and blanket, under which can be led the orifice of a tin kettle heated by a spirit-lamp, and provided with a spout two or three feet long. Various drugs of soothing or expectorant qualities, such as tincture of benzoin, spirit of chloroform, and menthol, can also be added to the water in the kettle, and so inhaled in the steam.

The relief to the cough and breathing and the aid to expectoration afforded by this simple plan are often surprising, and the cases are rare where it cannot be borne.

When the bronchitis is of the capillary form, the great object is to maintain the patient's strength, and to endeavor to secure the expulsion of the morbid secretion from the fine bronchi. In addition to the remedies already mentioned, stimulants are called for from the first; and should the cough be ineffectual in relieving the bronchial tubes, the administration of an emetic dose of sulphate of zinc, squill, or ipecacuanha may produce a good effect.

During the whole course of any attack of bronchitis attention must be paid to the due nourishment of the patient by light articles of diet; and during the subsequent convalescence, which, particularly in elderly persons, is apt to be slow, tonics and stimulants may have to be prescribed.

Chronic Bronchitis.—This form of the disease may arise as the result of repeated attacks of the acute form, or it may exist altogether independently. It occurs more frequently among persons advanced in life than among the young, although no age is exempt from it. The usual history of this form of bron-

chitis is that of a cough recurring during the colder seasons of the year, and in its earlier stages departing entirely in summer, so that it is frequently called "winter cough." In many persons subject to it, however, attacks are apt to be excited at any time by very slight causes, such as changes in the weather; and in advanced cases of the disease the cough is seldom altogether absent.

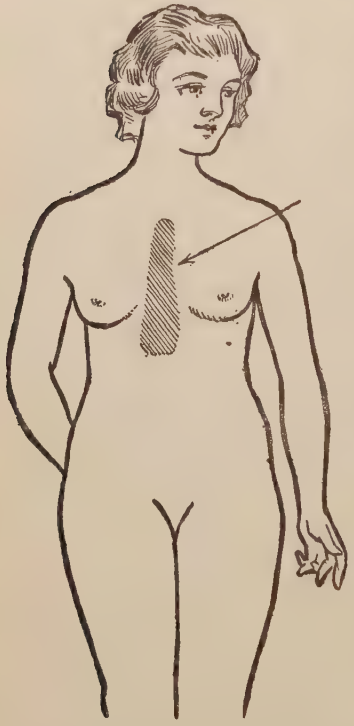
Chronic bronchitis may arise secondarily to some other ailment. This is especially the case in Bright's disease of the kidneys, and in heart disease, in both of which maladies it often proves a serious complication.

Symptoms.—The symptoms and auscultatory signs of chronic bronchitis are on the whole similar to those pertaining to the acute form, except that the febrile disturbance and pain are much less marked. The cough is usually more troublesome in the morning than during the day. There is usually free and copious expectoration of a thin frothy fluid, and occasionally this is so abundant as to constitute what is termed *bronchorrhea.*

Chronic bronchitis leads to alterations of structure in the affected bronchial tubes, their mucous membrane becoming thickened or even ulcerated, while occasionally permanent dilatation of the bronchi takes place, often accompanied with profuse fetid expectoration. In long-standing cases of chronic bronchitis, the nutrition of the lungs becomes impaired, and dilatation of the air-sacs (*emphysema*) and other complications result, giving rise to more or less constant breathlessness. Chronic bronchitis is liable, in some instances, particularly when accompanied with loss of flesh and strength, to be mistaken for consumption; but the physician who carefully regards the history of the case and observes the physical signs and symptoms will in general be able to distinguish the one disease from the other. In this, too, the examination of the sputum for the presence of the tubercle bacillus is of great importance, the discovery of this organism at once indicating the tubercular nature of the malady.

Treatment.—The treatment to be adopted in chronic bronchitis depends upon the severity of the case, the age of the patient, and the presence or absence of complications. Attention to the general health is a matter of prime importance in all cases of the disease, more particularly among persons whose avocations entail exposure, and tonics with cod-liver oil will be found highly advantageous. The use of a respirator in very cold or

damp weather is, for some old people, a valuable means of protection. In those aggravated forms of chronic bronchitis where the slightest exposure to cold air brings on fresh attacks, it may become necessary, where circumstances permit, to enjoin confinement to a warm room or removal to a more genial climate during the winter months.



When expectoration is difficult, such remedies as squill combined with carbonate of ammonia may prove useful. When, on the other hand, expectoration is excessive, astringents are called for. The inhalation of vapor containing iodine or turpentine is often followed by marked benefit in this way. Where breathlessness accompanies the disease, relief is often obtained from the use of iodide of potassium, or of ethereal preparations. The area as pictured in the drawing should be covered with a mustard plaster or a hot turpentine stupe. To prepare this, take a basin of hot water and moisten a piece of flannel in it. Then sprinkle some turpentine on the hot flannel after removing it from the water. This is quickly applied and covered with a heavy covering. It can be renewed as long as the skin is not burned.

In the aged, and in weak persons, stimulants are an indispensable part of the treatment. Acute attacks of the disease, which are so apt to arise in the chronic form, must be dealt with on the principles already indicated in treating of acute bronchitis.

℞ Flaxseed Tea one pint
Juice of two lemons.
Sugar two tablespoonfuls
Ammonium Chloride one teaspoonful
Mix.

Directions: Dessertspoonful every hour until cough is relieved.

And:

Apply hot flaxseed poultices around the chest, changing them frequently so as to keep them hot; or hot applications of antiphlogistine.

Or:

℞ Tincture of Aconite forty-eight drops
Sweet Spirits of Niter three drams
Mix.
Dose: Fifteen drops in cold water every three hours.

Or:

℞ Ammonium Chloride two-grain tablets
Dose: One every three hours.

For chronic bronchitis:

℞ Syrup of Ipecac one-half ounce
Syrup of Squill one-half ounce
Syrup of Tolu three ounces
Mix.
Dose: One teaspoonful in a wineglass of water, every four hours.

Inhalation:

℞ Compound Tincture of Benzoin one dram
Water one pint

Tonic:

℞ Syrup of Iodide of Iron one ounce
Emulsion of Cod-liver Oil six ounces
Mix.
Dose: One teaspoonful three times a day, half an hour after meals.

BRONCHIECTASIS

This is a remarkable condition which may come on in persons who have long suffered from bronchitis or from chronic pneumonia. The proper lung substance appears to undergo a certain amount of shrinkage, while at the same time the bronchial tubes become here and there distended into large cavities. These cavities are lined by mucous membrane, which continues to form a secretion, and this secretion, as it does not find a ready outlet by the bronchial tubes, undergoes putrid changes. The person therefore spits up from time to time a copious amount of

foul-smelling expectoration, and the air of the room in which he lies is rendered most offensive by his breath. The condition is not a serious one to life, and its symptoms are those of an aggravated form of chronic bronchitis. The treatment is that of chronic bronchitis, and in addition the smell of the breath is kept in check by inhalations of creosote, or by vaporizing creosote and other aromatic substances in steam near the person's bed.

℞ Oil of Eucalyptus one-half ounce
Dose: Five drops to be taken on lump of sugar, every four hours.

PLEURISY—PLEURITIS

Definition.—Pleurisy means inflammation of the pleura or serous membrane investing the lung and lining the interior of the thoracic cavity. It is a common form of chest complaint, and may be either acute or chronic, the latter being usually tuberculous in origin.

The morbid changes which the pleura undergoes when inflamed are similar to those which take place in other serous membranes, such as the peritoneum, and consist of three chief conditions or stages of progress. (1) Inflammatory congestion and infiltration of the pleura, which may spread to the tissues of the lung on the one hand, and to those of the chest wall on the other. (2) Exudation of fibrine on the pleural surfaces. This exudation is of variable consistence, sometimes composed of thin and easily separated pellicles, or of extensive thick masses or strata, or again, showing itself in the form of a tough membrane. It is of a grayish-yellow color, and, microscopically, consists mainly of coagulated fibrine along with epithelial cells and red and white blood corpuscles. Its presence causes roughening of the two pleural surfaces, which, slightly separated in health, may now be brought into contact by bands of fibrine extending between them. These bands may break up or may become organized by the development of new blood-vessels and formation of fibrous tissue, and, adhering permanently, may obliterate the pleural sac throughout a greater or less space, and interfere to some extent with the free play of the lungs. (3) Effusion of fluid into the pleural cavity. This fluid may vary in its char-

acters. Most commonly it is clear or slightly turbid, of yellowish-green color, sero-fibrinous, and containing flocculi of fibrine. In bad constitutions, or in cases where the pleurisy complicates some severe form of disease, i.e., the acute infectious maladies, it is deeply colored, bile-stained, sero-purulent, purulent, or bloody, occasionally containing bubbles of air from decomposition. The amount may vary from an almost inappreciable quantity to a gallon or more. When large in quantity, it may fill the pleural sac to distention, bulge out the thoracic wall externally, and compress more or less completely the lung, which may in such cases have all its air displaced and be reduced to a mere fraction of its natural bulk, lying squeezed up upon its own root. Other organs, such as the heart and liver, may in consequence of the presence of the fluid be shifted away from their normal position. In favorable cases the fluid is absorbed more or less completely and the pleural surfaces may unite by adhesions; or, all traces of inflammatory products having disappeared, the pleura may be restored to its normal condition. When the fluid is not speedily absorbed, it may remain long in the cavity and compress the lung to such a degree as to render it incapable of reëxpansion as the effusion passes slowly away. The consequence is that the chest wall falls in, the ribs become approximated, the shoulder is lowered, the spine becomes curved and internal organs permanently displaced, while the affected side scarcely moves in respiration. Sometimes the unabsorbed fluid becomes purulent, and an *empyema* is the result. In such a case the matter seeks vent in some direction, and it may point as an abscess upon the chest or abdominal wall, or, on the other hand, burst into the lung and be discharged by the mouth.

It must be observed that many cases of pleurisy are not associated with much effusion, the inflammation consisting chiefly in exudation of fibrine. To this form the term *dry pleurisy* is applied. Further, pleurisy may be limited to a very small area, or, on the contrary, may affect, throughout a greater or less extent, the pleural surfaces of both lungs.

Causes.—Pleurisy frequently arises from exposure to cold, being then probably of rheumatic nature; hence it is more common in the colder weather; but besides this, various other causes are connected with its occurrence. Thus it is often associated with other forms of inflammatory disease within the chest, more

particularly pneumonia, bronchitis, and phthisis, and also occasionally accompanies pericarditis. Again, it is apt to occur as a secondary disease in certain morbid constitutional states, i.e., the infectious fevers, rheumatism, gout, Bright's disease, diabetes, etc. Further, wounds or injuries of the thoracic walls are apt to set up pleurisy, and the rupture of a phthisical cavity in the lungs causing the escape of air and matter into the pleura has usually a similar effect. The connection of pleurisy with consumption is now recognized as a most important one. Very often it happens that an attack of pleurisy, which apparently has passed off, returns and is eventually followed by consumption, it may be after several years. Many of these cases are undoubtedly due to the presence of the tubercle bacillus in the pleural cavity.

Symptoms.—The symptoms of pleurisy vary, being generally well marked, but sometimes obscure.

Dry Pleurisy.—In the case of dry pleurisy, which is, on the whole, the milder form, the chief symptom is a sharp pain in the side, felt especially in breathing. Fever may or may not be present. There is slight dry cough; the breathing is quicker than natural, and is shallow and of catching character. If much pain is present the body leans somewhat to the affected side, to relax the tension on the intercostal muscles and their covering, which are even tender to touch. On listening to the chest with the stethoscope the physician recognizes sooner or later "friction," a superficial rough rubbing sound, occurring only with the respiratory acts and ceasing when the breath is held. It is due to the coming together during respiration of the two pleural surfaces which are roughened by the exuded fibrine. The patient may himself be aware of this rubbing sensation, and its vibration or "fremitus" may be felt by the hand laid upon the thoracic wall during breathing. This form of pleurisy may be limited or may extend over the greater part of one or both sides. It is a frequent complication of phthisis in all its stages. In general it disappears in a short time, and complete recovery takes place; or, on the other hand, extensive adhesions may form between the costal and pulmonary surfaces of the pleura, preventing uniform expansion of the lung in respiration, and leading to emphysema. Although not of itself attended with danger, dry pleurisy is sometimes preliminary to more serious lung disease, and, as al-

ready stated, is therefore to be regarded with some degree of anxiety.

Pleurisy with effusion is usually more severe than dry pleurisy, and, although it may in some cases develop insidiously, it is in general ushered in sharply by shivering and fever, like other acute inflammatory diseases. Pain is felt in the side or breast, of a severe cutting character, referred usually to the neighborhood of the nipple, but it may be also at some distance from the affected part, such as through the middle of the body or in the abdominal or iliac regions. This transference of the pain occasionally misleads the medical examiner. The pain is greatest at the outset, and tends to abate as the effusion takes place. A dry cough is almost always present, which is particularly distressing, owing to the increased pain the effort excites. The breathing is painful and difficult, tending to become shorter and shallower as the disease advances, and the lung on the affected side becomes compressed. The patient at first lies most easily on the sound side, but as the effusion increases he finds his most comfortable position on his back or on the affected side. When there is very copious effusion and, as is apt to happen, great congestion of the other lung, or disease affecting it, the patient's breathing may be so embarrassed that he cannot lie down.

In most instances the termination is favorable, the acute symptoms subsiding and the fluid (if not drawn off) gradually or rapidly becoming absorbed, sometimes after reaccumulation. On the other hand, it may remain long without undergoing much change, and thus a condition of *chronic pleurisy* becomes established. Such cases are to be viewed with suspicion, particularly in those who are predisposed to phthisis, of which it is sometimes the precursor.

Pleurisy may exist in a latent form, the patient going about for weeks with a large accumulation of fluid in his thorax, the ordinary acute symptoms never having been present in any marked degree. Cases of this sort are often protracted, and their results unsatisfactory as regards complete recovery.

The chief dangers in pleurisy are the occurrence of a large and rapid effusion, particularly if both sides be affected, causing much embarrassment to the breathing, and tendency to collapse; the formation of an empyema (often marked by recurring rigors and hectic symptoms); severe collateral congestion of the other

lung; imperfect recovery; and the supervention of phthisis. Further, the consequences are apt to be more serious when pleurisy exists as a complication of some preëxisting disease.

Treatment.—The treatment varies greatly with the form and severity of the attack. In the early inflammatory stage, one of

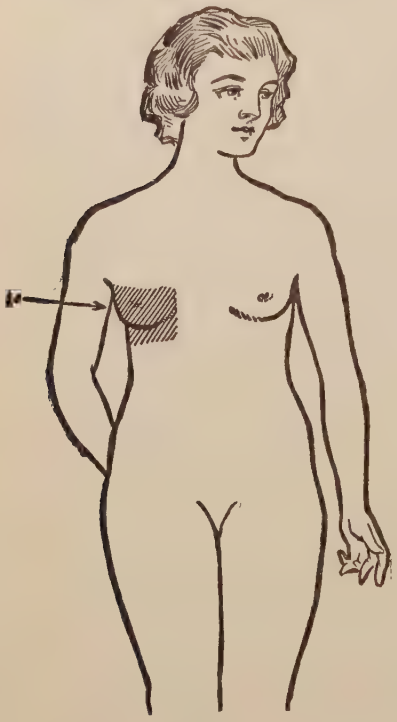


Fig. 1.

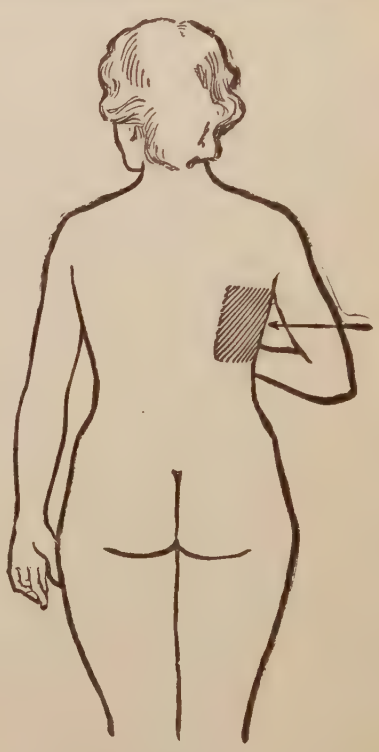


Fig. 2.

the chief symptoms calling for treatment is the pain, which may be soothed with the application to the chest of hot poultices or fomentations over the area indicated by the shaded lines in Fig. 1. Either a turpentine stupe may be used or else a flaxseed poultice applied. The chest should be kept covered with flannel at all times. The same applications can be applied over the back as outlined by the shaded area in Fig. 2. Many authorities apply, instead of these, an ice-bag to the side, and this has the effect of almost immediately soothing the acute pain. Another plan consists in the fixing, as far as possible, of one side of the chest by means of overlapping cross-strips of adhesive plaster very tightly bound.

Cases of simple dry pleurisy usually soon yield to such treatment, aided, if need be, by the application of blisters or iodine to the chest as the condition is subsiding.

In the case of pleurisy with effusion, in addition to these measures, blistering and the internal use of saline purgatives and diuretics appear to be often of service in diminishing the amount of the fluid in the pleural cavity, as are also powerful diaphoretics, such as pilocarpine. When these measures fail to reduce the effusion, the question of the artificial removal of the fluid comes to be considered. The operation (thoracocentesis or aspiration) was practised by the ancient physicians, but was revived in modern times by Bowditch. In cases of extensive accumulation, when other means, such as those briefly referred to, fail to reduce or remove the fluid in a short time, the only hope of preventing such compression of the lung as will impair its function lies in the performance of aspiration. All the more necessary does the operation become if the accumulated fluid is interfering with the function of other organs, such as the heart, or is attended with marked embarrassment of the breathing. The chest is punctured in the lateral or posterior regions, and in most cases the greater portion or all of the fluid may be safely drawn off. In general the operation is unattended with danger, although not entirely exempt from such risks as sudden fainting, and therefore not to be undertaken without due vigilance, as well as a careful consideration of the individual case and its associations. In many instances, not only is the removal of distressing symptoms speedy and complete, but the lung is relieved from pressure in time to enable it to resume its normal expansion. When there is any evidence that the fluid is purulent, the operation should be performed early. In such cases it is sometimes necessary to establish for a time a drainage of the pleural cavity by introducing a drainage tube through an opening in the lower part of the side, a portion of a rib being, if necessary, removed to admit the tube. The pleural cavity is then for some weeks or months irrigated through the opening at regular intervals, and treated exactly as any other large abscess cavity.

The convalescence from pleurisy requires careful tending, and the expansion of the lung may be assisted by suitable breathing exercises, or by connecting two wash-bottles in such a way that a quantity of fluid can be blown over from one to the other re-

peatedly. The latter exercise is graduated by blowing the fluid from one bottle to the other an increasing number of times on each successive day.

After an attack of pleurisy, and particularly after a second attack, the person should submit himself from time to time to medical examination, in order to make sure that phthisis does not develop in the lung. He will thus be enabled, if this serious disease should show itself, to commence its treatment at an early stage, when a cure may be expected.

℞ Tincture of Aconite one fluid ounce
Directions: Two drops in water every hour.

The diet should be confined to milk and starchy foods mainly, frequently administered, until fever has disappeared. No stimulants are needed except in the aged. No fried or fat foods or pork is allowed.

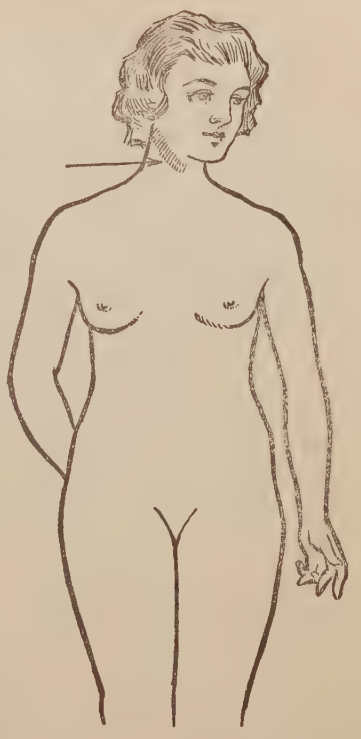
LARYNGITIS

Laryngitis, or inflammation of the mucous membrane of the larynx, may be either acute or chronic.

Acute Laryngitis.—This complaint is usually produced by exposure to cold, either directly or through a catarrh extending from the nose above or from the bronchial tubes beneath to the mucous membrane of the larynx. It accompanies some of the infectious diseases in which the throat is liable to suffer, such as measles, scarlatina, diphtheria, smallpox, and erysipelas. Excessive use of the voice, as in loud and prolonged speaking or singing, sometimes produces laryngitis. Further, the inhalation of irritating particles and vapor and the swallowing of very hot fluids are well recognized causes.

Symptoms.—The chief changes in the larynx are great redness and swelling, which affect the whole interior of the cavity, but are specially marked where the tissues are loose, such as the neighborhood of the epiglottis and of the vocal cords. The effect is to produce narrowing of the channel for the entrance of air, and to this the chief dangers are due. The symptoms vary with the intensity of the attack, but, along with more or less feverishness and constitutional disturbance, there is usually a sense of heat, dryness, and pain in the throat, as indicated by the shaded

area in the accompanying figure, attended with some difficulty in the act of swallowing. Cough is a constant symptom, and is either loud, barking, or clanging, or else husky and toneless. It is at first dry, but afterward is accompanied with expectoration. The voice, like the cough, is rough, husky, or may for a few days disappear almost entirely. The breathing shows evidence of laryngeal obstruction, both inspiration and expiration being prolonged and difficult, with a somewhat hissing sound, and with almost no interval between the two acts. In several cases the face and surface generally become livid, and suffocation threatens, particularly during the paroxysms of coughing. In favorable cases, which form the majority, the attack tends to abate in a few days, but on the other hand death may occur suddenly in a suffocative paroxysm, particularly in the case of children. Many cases of acute laryngitis are so comparatively slight as to make themselves known only by hoarseness and the character of the cough; nevertheless, in every instance the attack demands serious attention.



Treatment.—The treatment consists in keeping the patient in bed in an atmosphere of 60° to 70° F., made moist by steam. The use of warm gargles, and the frequent inhalation of the vapor of hot water containing such soothing substances as benzoin, conium, or menthol, and the application of hot fomentations to the front of the neck, will be found of much value. Internally, diaphoretics are also to be recommended. Such remedies usually suffice to relieve the attack, but in very severe cases more active interference may be necessary. When there is much swelling of the mucous membrane in the upper portion of the larynx, as shown by great obstruction of the breathing, scarification of the parts with the aid of the laryngoscope may afford relief, and even

tracheotomy may have to be performed where death appears to be imminent from suffocation. Attacks of laryngitis may be largely prevented in those liable to them by a regimen calculated to invigorate the system, such as the cold bath, regular open-air exercise, etc.

For acute laryngitis (spray):

℞ Oil Pine five drops
Oil Eucalyptus five drops
Albolene two ounces

Directions: Spray the throat three times a day.

Or:

℞ Tincture of Iodine fifteen drops
Glycerine one teaspoonful
Peroxide of Hydrogen one teaspoonful

Directions: Mix in a glassful of hot water and gargle well. Repeat every two hours.

Chronic Laryngitis.—This may occur as a result of repeated attacks of the acute form, or may arise independently owing to such causes as habitual exposure (especially where along with this there is overindulgence in alcohol), the habitual overuse of the vocal organs, etc. Any interference with the entrance of air through the nose, leading to the bad habit of mouth-breathing, has a great influence in setting up chronic laryngitis. The changes taking place in the parts are more permanent than in the acute form, consisting mainly in thickening of the mucous membrane, vocal cords, etc., with, it may be, ulceration and also sometimes destruction of the cartilaginous parts of the larynx.

Symptoms.—The symptoms vary according to the extent and amount, as well as the duration, of the inflammation. Thus there may simply be a certain huskiness or hoarseness on attempts at the use of the voice, this condition being well exemplified in the so-called clergyman's sore throat, or *dysphonia clericorum;* while, on the other hand, there may be not only complete loss of voice but severe pain in the act of swallowing, and great difficulty in breathing, accompanied sometimes with expectoration of large quantities of matter in the cases where ulceration is present. Under this variety of the disease may be included the ulceration due to syphilis and that occurring in the course of phthisis, both of which are attended with the symptoms now

mentioned. The diagnosis and the treatment of all such cases are greatly aided by the use of the laryngoscope, by which a view of the affected parts can be obtained, and the proper remedies more readily applied.

Treatment.—In the treatment of the chronic forms of laryngitis, rest to the parts is essential, any attempts at continuing the use of the voice only aggravating the condition; while tonic remedies and regimen should be diligently employed to strengthen the system generally. Applications to the affected parts in the forms of solutions of lactic acid, nitrate of silver, alum, tannin, etc., either by means of a brush or syringe introduced into the cavity or by the simpler method of spraying, are often beneficial. The insufflation of powders, such as iodoform or benzoin, is also of service, as are likewise inhalations of vapors of iodine, carbolic acid, turpentine, eucalyptus, etc. The diet must be made as simple as possible, and all irritating condiments such as mustard, pickles, and spices should be avoided. Alcohol is also highly prejudicial, especially in the form of strong spirits, and should be avoided.

℞ Carbolic Acid five drops
Tincture of Benzoin Compound two ounces
Turpentine five drops
Mix.
Directions: Put a teaspoonful in an open kettle with steaming hot water and inhale the vapor.

Also use the gargle prescribed under "Acute Laryngitis."
As a spray use the following:

℞ Iodine sixteen grains
Camphor one dram
Menthol one dram
Oil Pine Needles two drams
Albolene eight ounces

ASTHMA

Definition.—Asthma is a disorder of respiration characterized by severe paroxysms of difficult breathing, usually followed by a period of complete relief, with recurrence of the attacks at more or less frequent intervals. The term is often incorrectly em-

ployed in reference to states of embarrassed respiration which are plainly due to permanent organic disease within the chest, and which have none of the distinctive characters of true asthma.

Causes.—It is now generally held that the essential nature of the disease consists in a *spasmodic contraction* of the smaller bronchial tubes. This is due to some deranged condition of the nervous system, affecting, either directly or by reflex action, the nerves supplying the muscular fibers lining the bronchi and regulating their caliber. In addition, a certain amount of *congestion* or inflammation of the mucous membrane lining these small tubes is probably present, and this still more effectively hinders the free passage of air through them. The bronchial tubes being thus narrowed, and losing, for the time, their expansile power, air can only with the utmost difficulty be got into or out of the chest. In these circumstances, the muscles of the trunk concerned in respiration are called on to act with great violence to expand the chest, which can only with still greater difficulty be emptied, and hence the distress. But while asthma is thus to be regarded as essentially a nervous ailment, its occurrence, apart from some organic disease in the chest, i.e., former tuberculosis, or elsewhere, is comparatively rare.

Some cases, however, appear to be of purely nervous origin. To these the term *Nervous* or *Spasmodic Asthma* is applied, and it is more particularly to this form that the symptoms narrated below refer. In such cases no actual disease can be discovered with which the asthma could be directly connected. Attacks of this nature appear capable of being excited in those subject to them by various means. Thus violent emotions are not infrequently the cause of asthmatic paroxysms. The effect in exciting asthma caused by the inhalation of odors such as ipecacuanha, and of the pollen from hay and from other plants, is well known. In no particular is the eccentric character of this disease more remarkable than in that of locality. Changes of air, otherwise inappreciable, may give occasion to the most severe attacks of asthma, as, on the other hand, they may be the means of accomplishing a cure of the disease where it exists. Circumstances apparently the most trifling have been known to give rise to severe paroxysms of asthma, as the extinguishing of a light in a sleeping apartment or the shutting of a door.

But asthma is very frequently associated with some form of

chest complaint, more particularly bronchitis, and hence the term *Bronchitic Asthma.* The relation between the two ailments in such cases is rendered sufficiently obvious by the fact that the one does not occur without the other; and it is evident that the irritation of the bronchial mucous membrane gives rise, by reflex nervous action, to narrowing of the tubes. When the bronchitis is cured the asthma disappears.

Asthmatic-like paroxysms are also of occasional occurrence in some forms of heart disease, and the term *Cardiac Asthma* is used to describe such cases. They can, however, scarcely be regarded as cases of asthma, but rather as attacks of difficult breathing referable to some impediment to the pulmonary circulation, the result of the heart disease.

In persons who are the subject of chronic Bright's disease, attacks of asthmatic nature may also occur, the condition being then known as *Renal Asthma.*

Asthma is much more common in men than in women. It may be developed at any age, but is most frequently observed in early and middle life. A large number of cases originate in diseases affecting the respiratory system during infancy, such as whooping-cough, measles, and bronchitis. Asthma is often hereditary, and in all cases one attack appears to predispose to others.

Symptoms.—The onset of an attack of asthma is usually sudden, although there may exist certain premonitory symptoms which warn the sufferer of its approach, such as a feeling of discomfort, drowsiness, irritability, and depression of spirits. The period when the asthmatic paroxysm comes on is generally during the night, or rather in the early hours of morning. The patient then awakes in a state of great anxiety and alarm, with a sense of weight and tightness across the chest, which he feels himself unable to expand with freedom. Respiration is performed with great difficulty, and is accompanied by wheezing noises. His distress rapidly increases, and he can no longer retain the recumbent position, but gets up, and sits or stands with his shoulders raised, his head thrown back, and his whole body heaving with his desperate efforts to breathe. His countenance is pale or livid, and wet with perspiration, while his extremities are cold; his pulse is rapid and weak, and frequently irregular or intermitting. All his clothing must be loose about him; he cannot bear to be touched, and the very presence of others around

him seems to aggravate his distress. His one desire is to breathe fresh air; and he will place himself by an open window and sit for hours in the middle of the night, unmindful of the exposure. His appearance is alarming in the extreme, and it often seems as if each breath would be his last. The paroxysm, after continuing for a variable length of time, often extending over many hours, begins to abate, the breathing becomes easier, and the subsidence of the attack is frequently marked by the occurrence of coughing with expectoration. When the expectoration is abundant the asthma is called *humid*, but where there is a little or none it is termed *dry*. After the cessation of the attack the patient appears to be, and feels, comparatively well. In cases, however, of long standing, the subject of asthma comes to bear permanent evidence of its effects. He is easily put out of breath on exertion and he requires to lie with his head elevated, circumstances to be ascribed to organic changes in the chest, which oft-recurring attacks of asthma are liable to induce. The asthmatic paroxysms, although occasionally periodic, do not generally observe any regularity in their return. They may recur each successive night for several days, or there may be no return for many weeks or months, this being to a large extent dependent on a renewal of the exciting cause.

Treatment.—The treatment of asthma consists in the employment of remedies to allay the paroxysms, and in the adoption of measures likely to prevent their recurrence. During the attack the patient should be placed in as favorable circumstances for breathing as practicable. He usually selects the position easiest for himself. Abundance of air should be admitted to the apartment, and he should be interfered with as little as possible. The remedial agents employed with the view of relieving the paroxysms are very numerous, and only a few of the more important of them can be alluded to. Much value is attached by many to the smoking of stramonium, and even tobacco smoking appears in some instances to give relief. The fumes of niter-paper (blotting-paper prepared by being dipped in a saturated solution of niter and dried) burned in the apartment often succeed in mitigating the paroxysm. Glass capsules containing nitrite of amyl, which are crushed and held beneath the nostrils, sometimes give considerable relief in bad cases; so too does paraldehyde in teaspoonful doses, or the tincture of *lobelia inflata*,

Adrenalin either inhaled from a spray or injected beneath the skin sometimes gives immediate relief in a paroxysm. None of these remedies, however, ought to be tried without medical advice. An emetic is often useful when the attack is due to some error in diet. Coffee is a popular and useful remedy, but, to do good, the infusion must be very strong, and taken upon an empty stomach. Dry cupping of the back, and placing of the hands in very hot water contained in basins placed at the side of the bed, are other household remedies often followed by considerable relief. To prevent the recurrence of the paroxysms special care must be taken by the sufferer to avoid those influences, whether connected with locality or mode of life, which his experience may have proved to have been the occasion of former attacks. Particularly must care be taken to avoid exposure to the weather and other influences apt to bring on bronchitis. Where the paroxysms are of periodic occurrence, the use of quinine or arsenic has been tried with good results.

℞ Tincture of Hyoscyamus two teaspoonfuls
Tincture of Lobelia two teaspoonfuls
Tincture of Belladonna one teaspoonful
Simple Elixir two ounces

Mix.

Dose: One teaspoonful in water when breathing is difficult.

A simple home remedy is to make a strong solution of saltpeter and moisten pieces of blotting-paper in it. Allow them to dry. When a spell or paroxysm is felt, burn a piece of this saturated paper and inhale the fumes.

℞ Ammonium Carb. one and one-half drams
Potassium Iodide one dram
Fluidextract Senega five drams
Liquor Potassium Arsenatis one-half dram
Syrup Tolu one ounce
Water enough to make four ounces

Dose: One teaspoonful in water every three or four hours as needed.

Diet.—Red meats should be partaken of sparingly, but fowl and fish are allowable. Avoid fried foods and fats. Eggs, on account of their high nitrogenous value, are not advisable. Water in abundance should be taken.

EMPHYSEMA

Emphysema means an abnormal presence of air in certain parts of the body. In its restricted sense, however, it is generally employed to designate a peculiar affection of the lungs, of which there are two forms. In one of these there is over-distention of the air-cells of these organs, and in parts destruction of their walls, giving rise to the formation of large sacs, from the rupture and running together of a number of contiguous air-vesicles. This is termed *vesicular emphysema.* In the other form the air is infiltrated into the connective tissue beneath the pleura and between the pulmonary air-cells, constituting what is known as *interlobular emphysema.*

Vesicular Emphysema is by far the more common. It appears to be capable of being produced by various causes, the chief of which are the following:

1. Where a portion of the lung has become wasted, or its vesicular structure permanently obliterated by disease, without corresponding falling in of the chest wall, the neighboring air-vesicles or some of them undergo dilatation to fill the vacuum.

2. In some cases of bronchitis, and especially of bronchial asthma, where numbers of the smaller bronchial tubes become obstructed, the air in the pulmonary vesicles remains imprisoned, the force of expiration being insufficient to expel it; while, on the other hand, the stronger force of inspiration being adequate to overcome the resistance, the air-cells tend to become more and more distended, and permanent alterations in their structure, including emphysema, are the result.

3. Emphysema also arises from exertion involving violent expiratory efforts, during which the glottis is constricted, as in paroxysms of coughing, in straining, and in lifting heavy weights. Whooping-cough is well known as the exciting cause of emphysema in many persons.

Symptoms.—In whatever manner produced, this disease gives rise to important morbid changes in the affected portions of the lungs, especially the loss of the natural elasticity of the air-cells, and likewise the destruction of many of the pulmonary capillary blood-vessels, and the diminution of aerating surface for the blood. As a consequence of these, other changes are apt to

arise affecting related organs, more particularly the heart and the venous system generally, one of the most frequent results of which is the occurrence of dropsy. The chief symptom in this complaint is shortness of breathing, more or less constant but greatly aggravated by exertion, and by attacks of bronchitis, to which persons suffering from emphysema appear to be specially liable. The respiration is of similar character to that already described in the case of asthma. In severe forms of the disease the patient comes to acquire a peculiar puffy or bloated appearance, and the configuration of the chest is altered, assuming the character known as the *barrel-shaped* chest.

Treatment.—The main element in the treatment of emphysema consists in attention to the general condition of the health, and in the avoidance of all causes likely to aggravate the disease or induce its complications. The same general plan of treatment as that recommended in asthma and bronchitis is applicable in emphysema. During attacks of urgent breathlessness antispasmodic remedies should be had recourse to, while the employment of dry cupping back and front over the lungs, and even of moderate wet cupping, together with inhalation of oxygen, will often afford marked and speedy relief.

The following prescription will be found very beneficial:

℞ Tincture of Lobelia two teaspoonfuls
Tincture of Hyoscyamus three teaspoonfuls
Simple Elixir three ounces
Mix.
Dose: One teaspoonful in a wineglass of water, when breathing is difficult.

CONGESTION OF THE LUNGS

Congestion of the lungs is a term which is used in two different senses. Popularly the word is used in place of inflammation or pneumonia, particularly when this disease is in its early stages or is so limited in extent that the person affected speedily regains his health.

In strict medical language, the term is used to mean quite a different condition of a more chronic nature, viz., passive or mechanical congestion of the blood-vessels in the lungs due to some defect in the pumping action of the heart. Passive con-

gestion arises under two sets of conditions. A very serious form, known as "hypostatic congestion," arises when the heart is failing, toward the end of severe and long-continued fevers, such as typhoid fever; after severe surgical operations; and in old people who for any reason, such as the occurrence of a broken leg, are confined for some weeks to bed. It occurs in the back parts of the lungs, in consequence of the feeble heart being unable to drive out of them the blood which gravitates into these dependent parts. Inflammation is very apt to arise in these congested parts, and "hypostatic pneumonia" often ends the life of old or feeble persons confined to bed. The other form of passive congestion is due, not so much to weakness in the pumping action of the heart, as to some obstruction which hinders the escape of blood from the lungs into the left auricle of the heart. Narrowing of the opening which leads from the left auricle to the left ventricle (mitral stenosis) is the chief cause of this, and, though the condition is by no means so serious as the "hypostatic" form of congestion, it predisposes the persons affected by this form of heart disease to sharp attacks of blood-spitting on exertion, to frequent bronchitis, and to pneumonia.

The treatment, in both cases, must be directed toward stimulating the heart and increasing the force of its beats.

Diet.—Until the crisis has passed and the patient is on the way to recovery, the diet should consist of milk and beef juices. About the seventh day, orange juice in teaspoonful doses, six to eight times a day, is beneficial. When the fever has subsided, crackers and toast may be added. After the ninth day, broiled meats in small amounts, together with starchy foods such as rice, tapioca, arrowroot, corn-starch, and potatoes, are allowed.

ABSCESS OF THE LUNGS

This is a comparatively rare condition, and consists, like abscesses elsewhere, of a collection of pus in one or more spots of the lung. It may result from an acute pneumonia which does not clear up properly, or it may be due to a wound of the lung from without, or to the presence of foreign bodies such as buttons, pins, or fragments of food, which have been sucked down the air-passages. An abscess may also occur in the lung, as in

other organs, during the course of blood-poisoning (pyemia), or may be produced by the bursting of an abscess into the lung after its formation in some neighboring organ. The condition is hard to tell from cavity formation due to consumption; though the failure to find tubercle bacilli in the expectoration, after repeated examination, is an important point against the latter condition.

An abscess in the lung may burst into one of the bronchial tubes, and, after the pus is coughed up, healing and recovery may take place. On the other hand, an abscess in one of these organs is apt to go on constantly discharging, and thus to undermine the general health. For this reason it is sometimes sought to evacuate the abscess through the side, portions of two or three ribs being removed and the lung fixed to the chest wall by sutures. The operation is a dangerous one to life, but if successful may result in a complete cure.

EDEMA OF THE LUNGS

Edema of the lungs is a condition in which these organs become dropsical. It occurs both when congestion is present as the result of heart failure, and also, during Bright's disease, following dropsy in other parts of the body. It gives symptoms of its onset in constant rattling noises proceeding from the lungs and air-passages of the affected person, whose face becomes gradually more livid, and who experiences great difficulty in breathing. The edema may be accompanied by the collection of fluid in the pleural cavities (hydrothorax), and, if the condition be not speedily relieved, the person dies, literally drowned in the fluids of his own body.

COLLAPSE OF THE LUNGS

Collapse of the lungs occurs under several conditions. The lungs are so resilient in consequence of the elastic fibers with which they are everywhere interspersed that, if air be admitted to the pleural cavities, the lungs immediately collapse to a third of their natural bulk. Accordingly, if one side of the chest be wounded and air be admitted (pneumothorax), the lung collapses, though, after the wound is healed, the air is absorbed

from the pleural cavity and the lung quickly regains its size. Also when fluid is effused into the pleural cavity the lung is compressed and collapses, and if the fluid be not absorbed or drawn off within some weeks, the collapse is apt to be permanent through the formation of adhesions round the lung. Again, if anything blocks a bronchial tube, the part of the lung to which it leads collapses, since these tubes do not communicate with one another. Thus, in children suffering from bronchitis or pneumonia, areas of the lung may collapse through a plug of mucus sticking in a bronchus, which the child is not sufficiently strong to free by coughing. A similar result is brought about by foreign bodies drawn into the air-passages. Collapse of both lungs is necessarily fatal, as breathing then comes to a complete standstill, since the movements of the chest become ineffectual to draw air into these organs. If one lung be completely collapsed, as in cases where the chest is opened on one side to drain away a collection of pus, or where a large amount of fluid exists in one pleural cavity, the second lung, being healthy, is sufficient to overtake the needs of respiration, expanding as a rule somewhat in the process.

℞ Aromatic Spirits of Ammonia one ounce
Dose: One teaspoonful in water every two hours.

TUMORS OF THE LUNGS

Tumors of the lungs are not of frequent occurrence, though cancer occasionally begins in the lung. Tumors more commonly take their origin in the space between the lungs and cause difficulty of breathing and other symptoms by the pressure they exert upon these organs or on the bronchial tubes. Hydatid cysts are found from time to time in the lungs.

WOUNDS OF THE LUNGS

Wounds of the lungs are serious both by reason of the damage they may do to this organ and by admitting air into the pleural cavity, so that the lung collapses. The lung may be wounded by the end of a fractured rib, or by some sharp body pushed between the ribs, and it may also be torn as the result of disease;

for example, a consumptive and excavated lung may be perforated during a fit of coughing. If by any cause a free opening is made between the pleural cavity and air-passages, immediate difficulty of breathing, due to collapse of the lung, ensues, the person gets livid, and is found to be suffering at first from shock. Generally, however, the person recovers from the immediate symptoms, and if the perforation be caused by a wound from without, the wound may heal without leaving any permanent damage.

Wounds of the lung are chiefly dangerous on account of the risk of wounding large blood-vessels. Spitting of blood in any quantity after a wound of the chest has been received is a sign that the lung has been injured. A stab or bullet wound which does not injure any large vessel may traverse the lung without any serious consequences, but if a large vein or artery be torn death is likely to ensue.

GANGRENE OF THE LUNGS

Gangrene is another result which may follow pneumonia in persons of poor constitution or debilitated by serious illness. Just as in the case of gangrene of limbs, a portion of lung dies and putrefies, giving rise to a most offensive smell as the dead and broken-down lung tissue is coughed up. The prospect of recovery is very small, even when the portion of lung involved is very limited.

The following is recommended to destroy the putrid odor of the breath present in this condition:

℞ Creosote ten drops
Tincture of Gentian Compound one ounce
Pure Rye Whisky one ounce
Mix.
Dose: One teaspoonful, with a swallow of water, every three hours.

HEMOPTYSIS (SPITTING OF BLOOD)

Definition.—Hemoptysis means the spitting up of blood from the lower air-passages. The blood is usually coughed or gently hawked up, it may be in mouthfuls at a time, and is bright red and frothy, thus differing from the blood brought from the

stomach. Generally the condition results from some disease of the heart or lungs. It should be remembered, however, that in elderly people hemoptysis is usually due to a varicose condition of the small veins in the throat, not to hemorrhage in the lungs; while in young people this condition is often due to bleeding from the nose, in which, owing to the position of the head, the blood happens to run backward instead of forward through the nostrils.

Treatment.—The patient should be kept quiet; also cold applications to the chest and small pieces of ice may be taken by mouth.

℞ Calcium Lactate ten-grain tablets
Dose: One tablet every hour until bleeding stops.
Do not give more than six tablets.

PLEURO-PNEUMONIA

Pleuro-pneumonia means a combination of pleurisy with pneumonia. Acute pneumonia is practically always accompanied by a certain amount of pleurisy, to which the pain experienced in pneumonia is mainly due. The epidemic disease known as pleuro-pneumonia, which is so fatal to horned cattle, does not affect man.

PNEUMOCONIOSIS

Pneumoconiosis is the general name applied to a chronic form of inflammation of the lungs which is liable to affect workmen who constantly inhale irritating particles at work. The disease produced may be of the nature of chronic interstitial pneumonia, but is very liable to result in true phthisis from the engrafting of the tubercle bacillus upon the diseased lung. Some of the trades most liable to suffer are those of stonemasons, potters, steel-grinders, and less often coal-miners, millers, and workers in cotton, flax, or wool mills.

℞ Potassium Iodide five-grain tablets
Dose: Dissolve one tablet in half a glass of water every four hours.

The following tonic stimulates the growth of lung tissue:

℞ Emulsion of Cod-liver Oil eight ounces
Dose: One tablespoonful half an hour after each meal.

COUGH

In the great majority of instances cough is due to something wrong in the respiratory system—larynx, windpipe, bronchial tubes, or lungs—sometimes to conditions outside the respiratory organs. A dry cough, with little or no expectoration, occurs in the first stages of bronchitis, consumption, asthma, whooping-cough, influenza, and pneumonia; also in pleurisy; inhalation of dust or irritating fumes; or from the tickling of a long uvula. A single, slight, dry cough, frequently repeated, is the "hacking" cough of the earliest stages of consumption.

A loose cough with abundant expectoration occurs in the later stages of the diseases first mentioned above, and in some other lung diseases.

Cough coming in fits or paroxysms is seen most characteristically in whooping-cough. A paroxysmal cough with long intervals between may be due to cavities in the lung. Under such circumstances large amounts are expectorated in a short time, the cough ceasing until the cavity fills up again.

Laryngeal Cough.—This is dry but hoarse, ringing or "brassy" in character. It may be due to laryngitis, croup, or to food particles going in "the wrong way." The monotonous croaking cough sometimes due to hysteria is also laryngeal, and so is the cough met with in some cases of aneurism of the aorta.

Suppressed cough is a sign that coughing is painful or exhausting, as in pneumonia, pleurisy, and peritonitis.

Winter cough, disappearing in summer, means either chronic bronchitis or a very chronic form of consumption.

Cough due to conditions outside the respiratory organs may come from hysteria, wax in the ear, adenoids, long uvula, aneurism, or heart disease.

Stomach cough is found at times in the subjects of chronic gastric catarrh.

The treatment of cough depends on the cause, for intelligent treatment should be directed toward removing the cause and not merely suppressing the cough. If very incessant and troublesome, sedative drugs may be necessary; but it is by no means always safe to check cough by these means, especially in children

and old people. We would merely say that in the great majority of cases great relief is given to a cough if the air inhaled be moist. This can be accomplished by having a kettle with a long spout projecting into the room, or by inhaling occasionally the steam coming from a pitcher of boiling water.

The following are well used formulas for different ages:

OLD FOLKS

℞ Aromatic Spirits of Ammonia one fluid ounce
Spirits of Chloroform two fluid drams
Peppermint-water two fluid ounces
Mix.
Dose: One teaspoonful every four hours.

CHILDREN

℞ Wine of Ipecac one fluid dram
Brown Mixture modified without
Opium four fluid ounces
Mix.
Dose: Ten to fifteen drops in water every four hours.

INFANTS

℞ Spirits of Camphor five minims
Tincture of Belladonna two minims
Quinine Sulphate three grains
Syrup Tolu three fluid ounces
Mix.
Dose: One-half teaspoonful every three hours.

FROM 16 TO 50 YEARS OLD

℞ Syrup of Tolu four fluid drams
Syrup of Squill one and one-half fluid ounces
Wine of Ipecac one and one-half fluid ounces
Brown Mixture modified without
Opium two and one-half fluid ounces
Mix.
Dose: One teaspoonful every three hours.

Or:

℞ White Pine and Tar Syrup four fluid ounces
Dose: One teaspoonful every three hours.

Immediate relief is best assured by local treatment, and the following is a favorite formula:

℞ Menthol one grain
Camphor one grain
Liquid Petroleum one ounce
Mix.
Directions: Place two drops on a piece of cotton and insert into each nostril.

Or:

℞ Liquid Peptonoids and Creosote ..four fluid ounces
Dose: One teaspoonful every three hours.

Or:

℞ Chloride of Ammonia ..two drams
Fluidextract of Licorice.two fluid drams
Syrup of Wild Cherry ..one fluid ounce
Water one and one-half fluid ounces
Mix.
Dose: One teaspoonful every three hours.

HICCOUGH

Definition.—Hiccough is a spasmodic indrawing of air to the lungs, ending with a click, due to sudden closure of the vocal cords. The cause is some irritation of the nerves which go to the diaphragm, producing sudden contractions of the latter. Most cases, especially those recurring habitually about the same hour of the day, are due to indigestion, and the symptom also occurs in some serious general diseases, like the uremia of Bright's disease and typhoid fever, being in such cases a grave sign.

Treatment.—If the condition be due to dyspepsia, it is often relieved by some aromatic like a teaspoonful of Hoffmann's anodyne, or a tablespoonful of peppermint water or cinnamon water. When continuous and excessive it is usually controlled by bromides.

℞ Ammonium Bromide six teaspoonfuls
Spirits of Anise twenty drops
Simple Elixir two ounces
Dose: One teaspoonful, when the attack starts.

One teaspoonful of vinegar mixed with one teaspoonful of sugar and eaten slowly will often relieve.

Taking nine sips of water and at the same time holding the breath will often prove effective.

Simple methods have proved very successful when all other methods and medication have been tried. The most noted (both of which were discovered by accident in endeavoring to accomplish other treatment and which have since never failed) are: (1) Press the back of the tongue down and backward with the handle of a large spoon for about one minute. This is to be continued if the hiccough returns, as it generally does, when, after two or three treatments, it will cease for good. (2) This method (one which is praised the most) is to stretch the tongue by holding it between the fingers or a suitable instrument, as tongue forceps, pulling it out as far as possible and holding it there for two minutes.

A simple and effective remedy is:

℞ Tincture of Camphor three drops
Ammonia-water (medicinal) three drops
Directions: Add to one-half glass of water.

When due to indigestion, the following is recommended:
℞ Bicarbonate of Soda one dram
Tincture of Nux Vomica one dram
Tincture of Cardamom three ounces
Dose: One teaspoonful in water before meals.

BREATHLESSNESS

Pleurisy causes short, rapid breathing to avoid the pain of deep inspiration.

Narrowing of the air-passages may produce sudden and alarming attacks of difficult breathing, especially among children; e.g., in laryngismus, croup, asthma and diphtheria (see these headings).

Almost all *affections of the heart* cause breathlessness when the person undergoes any special exertion.

Among the *general diseases* which may interfere with breathing, the uremia of Bright's disease and the coma at the end of diabetes must be noted.

FIRST AID

INTRODUCTION

BY First Aid is meant the assistance which can be given in cases of accidents or emergencies by those who, with certain easily acquired knowledge, are in a position not only to relieve the sufferer to a considerable extent, but also to prevent any further mischief being done pending the arrival of a doctor. Consequently it will be realized that the extent of the first aid depends largely, in the hands of one possessing such knowledge as will be gained by a study of this department, on the distance from proper medical help. In towns where a doctor can be summoned without much loss of time, we need what may truly be called First Aid; in distant and outlying parts much more can be done to alleviate the suffering and promote the physical and mental well-being of the patient, if not, indeed, to hasten the recovery, and many lives have been saved by the prompt action of the man on the spot in cases of accident. There are a few general principles on which anyone can act. Above all, it is necessary to keep cool and collected; much can be done quickly without the appearance of hurry and panic so distressing to everyone, and not the least to the patient.

Should there be an obvious cause of injury or danger, it must be removed as soon as possible, and in the case of more than one injury, discretion must be exercised as to which to tackle first. In all cases where there is bleeding, the first object must be to control this by whatever means is most convenient and suitable. With any accident there is always a certain amount of shock: the best means of keeping this as small as possible is by warmth. See that the patient is well covered up and in the position of greatest comfort compatible with the injuries. It is not usually necessary to remove any clothing, but in cases where it is advisable, this must be done with the minimum of discomfort to the

patient, regardless of the consequences to the clothes. In removing a coat the sound arm should be withdrawn first: this will enable the sleeve to be pulled gently off the other arm without much trouble, or it may be necessary to rip up the sleeve on the affected side. A shirt should be completely slit up the front, and removed in a similar manner to the coat. Trousers can be easily removed by slitting up the outer seam, and shoes by slitting up the back seam and removing the laces. Socks should be cut off, preferably by a pair of blunt-pointed scissors.

Care must be exercised in attempting to stimulate a person who has met with an accident. Spirits should not be rashly given, nor, indeed, should anything, till it is certain that the patient can swallow. A drink of water, milk, tea, or coffee is all that should be given. Smelling-salts may be applied to the nose, and cold water applied to the face and head.

In the excitement of the moment, what is everybody's business is apt to be no one's; and it is too often taken for granted that medical aid has been summoned, though no one has actually been sent. The person who takes charge of a case must see to it that someone has gone for a doctor at the very beginning. Should the doctor arrive immediately, the case is in his hands, and the best thing has been done for the patient; should there be a delay, it is not due, in any way, to the person who sent for help at once, and in the meantime much may be done till the doctor arrives.

ASPHYXIA

Definition.—Asphyxia means literally absence of pulse, but is the name given to the whole series of symptoms which follow stoppage of breathing and of the heart's action from any cause.

Causes.—For practical consideration by far the most important cause is *drowning*. Blockage of the air-passages occurs in some diseases, such as croup, diphtheria, swelling of the throat due to wounds or inflammation, asthma (to a partial extent), tumors in the chest (causing slow asphyxia), and the external conditions of suffocation and strangling. Poisonous gases also cause asphyxia. Carbonic acid in large amount in the air, due to the breathing of a number of individuals in a small space, as in the Black Hole of Calcutta, or to the fumes of a charcoal brazier in a badly ventilated room, has often caused death. Coal-

gas is still more deadly, and several gases, such as sulphurous acid (from burning sulphur), ammonia, and chlorine (from bleaching-powder), cause involuntary closure of the entrance to the larynx, and thus prevent breathing. Other gases, such as nitrous oxide (or laughing-gas), chloroform, and ether, in poisonous quantity, cause stoppage .of breathing by paralyzing the respiration-center in the brain.

Symptoms.—In the vast majority of cases death from asphyxia is due to insufficiency of oxygen supplied to the blood. The first signs—apart from instinctive efforts to escape from the cause, such as the struggles of a drowning man—are rapid pulse and gasping for breath. Next comes great increase in the pressure of the blood, causing throbbing in the head, with lividity or blueness of the skin, due to failure of aeration of the blood, followed by still greater struggles for breath and by general convulsions. In this stage, the veins and right side of the heart become overfilled with blood, owing to stoppage of the circulation, which follows contraction of the minute arteries all over the body from the irritation of the impure blood in them. Accordingly, the heart becomes over-distended and gradually weaker, a paralytic stage sets in, and all struggling and breathing slowly cease. When, on the other hand, asphyxia is due to charcoal fumes, coal-gas, and other narcotic influences, there is no convulsive stage, and death ensues gently and may occur in the course of sleep. These are the chief signs of death by asphyxia, but each cause produces distinguishing signs of its own.

Treatment.—So long as the heart continues to beat, recovery may be looked for under prompt treatment. The one essential of treatment is to get the impure blood aerated by artificial respiration. When the heart is very feeble or even stopped, the face extremely blue, and the veins of the neck and arms swollen, the person's life may possibly be saved by opening a vein in the arm or neck, and so allowing the blood to escape and the heart to contract again.

BANDAGING

Bandages are pieces of cloth made of different materials used as a support for injured parts or to cover wounded surfaces. There are two common forms of bandages, the emergency triangular bandage and the ordinary roller bandage.

The triangular bandage is valuable for any accident or ambulance work. It is now used on the battle-field when medical attention is not at hand. It is made by taking a piece of calico or other soft material, about one yard square. This is then cut across cornerwise, making two triangular bandages; these may be folded over to form a narrow band, or applied without folding.

Bandage for shoulder. Two triangles: one folded into sling for wrist; the second with point on neck and ends tied around the arm.





Bandage for elbow. Triangle folded broad is laid with center on elbow; ends are crossed in front, carried round forearm, crossed again in front, carried round upper arm and tied.



Front.



Back.

Bandage to cover chest. One triangle: the point is laid over one shoulder, the ends carried round the sides and tied over the same shoulder-blade; the longer of the two ends is carried up and tied to the point. To cover the back the same bandage is used with knots in front.



Bandage for groin. Two triangles, folded narrow and tied end to end.



First stage.



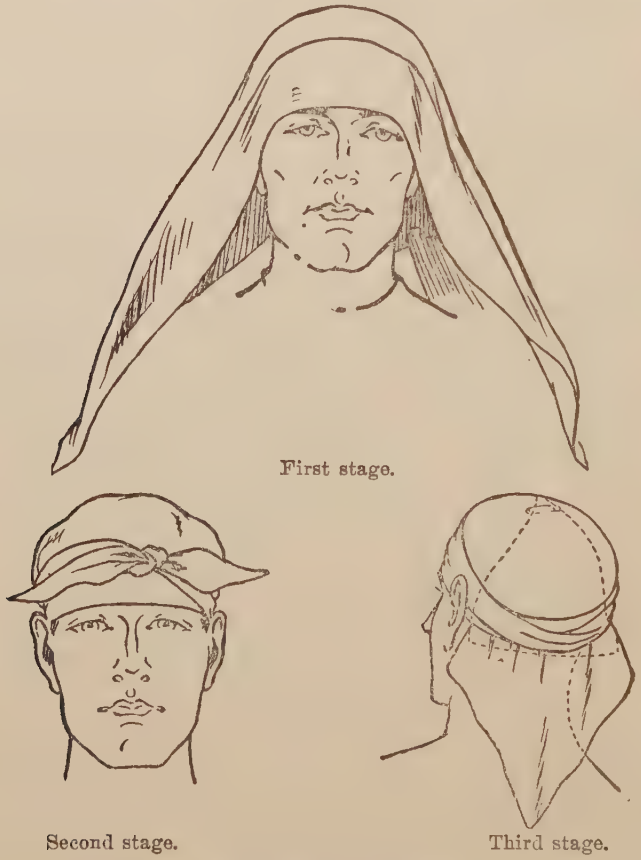
Finished.

Bandage for hip. Two triangles: one folded narrow and tied round waist; the other with point on the side and ends tied round thigh.

Bandage for head. (See next page.) Triangle with a hem turned up on base is placed with center of base on forehead and point on back of neck; ends are carried behind head, crossed on neck, carried forward, and tied on forehead. Point is finally pinned up, and is complete.

Roller bandages are strips 10, 15, or 20 feet long, and varying in width from 2 to 4 inches, according as a limb or the body is to be covered. They are generally sterilized before use, or impregnated with some antiseptic, and may be of flannel, which can be washed and used repeatedly, of calico, or of cheesecloth. The chief methods of applying roller bandages are: *Simple spiral,* in which the bandage circles up the limb, each turn overlapping half of that preceding. This is used for a cylindrical

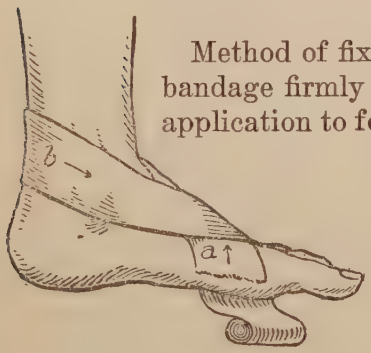
part of the body like the upper arm. *Spiral with reverses,* in which the bandage is turned sharply over on itself at each circle so as to lie smooth when the circles tend to separate widely. It is used for conical parts like the forearm or calf. *Figure of 8,* in which the bandage loops alternately round two parts of the body. It is used to cover a projection or hollow such as the



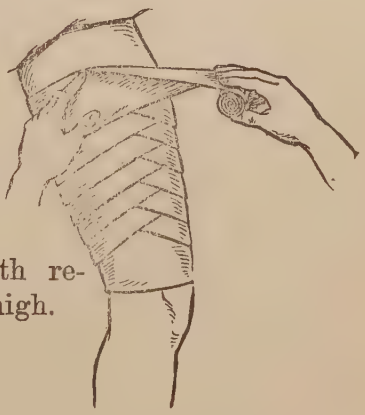
BANDAGE FOR HEAD.

shoulder or armpit, by looping round trunk and arm alternately. *Spica,* which is used for a joint, the turns covering one another completely in the bend of the joint, and separating partly over the prominence like the arrangement in a coat of mail. It is simply a modified figure of 8. *Trefoil* is a turn round the limb, and covering this with the subsequent turns of the bandage. The bandage must pass upward or the limb will become blue owing to the blood in the superficial veins being pressed backward to-

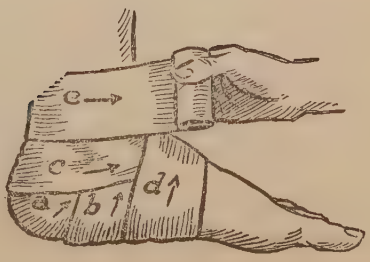
ward the extremity of the limb. It should cross the front of the limb from within outward in order to give more room for making reverses toward the outer side. Where skin surfaces come into contact, one should be separated from the other by absorbent cotton, as otherwise moisture accumulates and the surfaces readily become abraded. This should be done, for example, between the fingers, behind the ear, in the armpit, etc. In order to make the bandage lie smoothly it is important in applying it that the head of the bandage should always, except in reversing, remain in contact with the part that is being bandaged, round which it is simply rolled. The width of roller bandages varies; for the finger, 1 inch is the usual width; for the head, 2 inches; for the arm, 2½ inches; for the leg, 3 inches; for the abdomen or chest, 4 or 5 inches.



Method of fixing bandage firmly for application to foot.



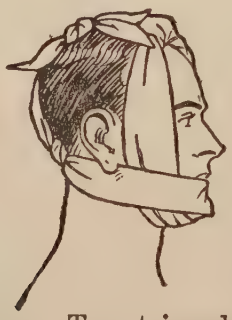
Spiral with reverses for thigh.



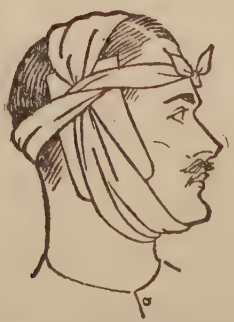
Bandage covering heel. First turn covers heel, second and third bind down its loose edges; fourth and fifth bind down the loose edges of second and third.



Bandage for the eye. Triangle folded narrow; center is placed over the eye, ends carried around the head, crossed, carried forward and tied.



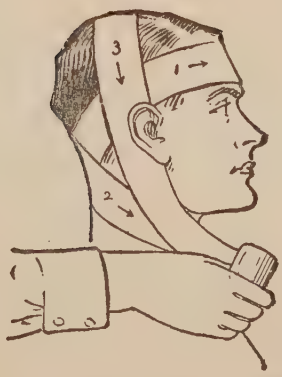
Bandage for lower jaw. Two triangles folded narrow; place one with center under chin and the other with center in front of chin. The former is tied on top of forehead, the latter is tied in back of head. The ends of both are tied together and completed.



Bandage for side of head. Triangle folded narrow; center is placed over one ear; one end carried over the top of head, the other beneath chin; the two turn over each other above the opposite ear and are then carried to the forehead and tied.



First stage.



Second stage.



Third stage.

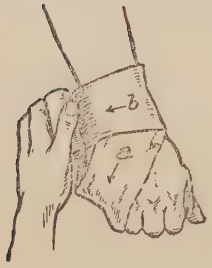


Fourth stage.

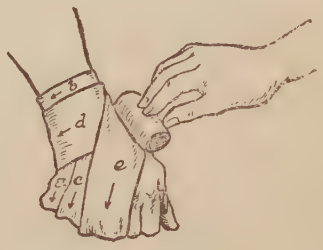
Bandage for head (trefoil). This consists essentially of three turns repeated in order. The first stage shows commencement on the nape of the neck and first turn; the second stage shows second and third turns, the bandage next passing below chin and round to nape of neck; the third stage shows the gradual covering in of head; the fourth stage shows the final action. To fix all a final turn in the position of the first should be made low down on the nape of the neck behind and close above the eyebrows in front.



Same bandage (trefoil) from the other side. Shows that the vertical turns pass behind the ear on one side, in front of it on the other. When bandage is used to cover in one ear, the first turn should pass round the other side of the head, as shown. This bandage cannot be used to cover in that part of the head shown bare in the fourth stage, for which the capelline bandage or a four-tailed bandage may be used.



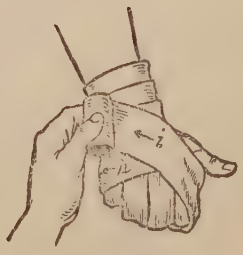
First stage.



Second stage.



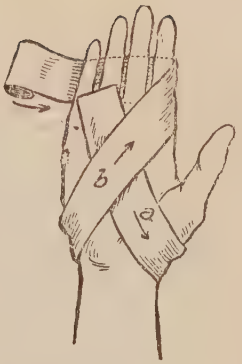
Third stage.



Fourth stage.

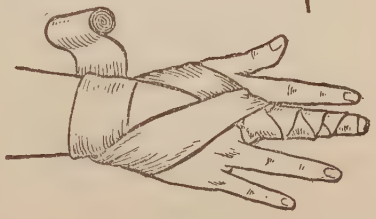
Bandage for closed fist, in which a pad of wool should be placed. There are alternate loops round wrist and round knuckles.

Method of fixing bandage before commencing spiral with reverses for hand.



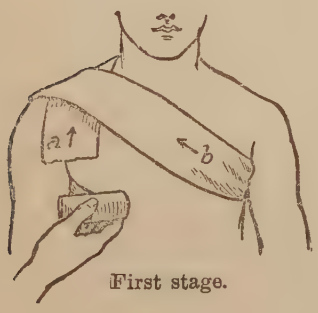


First stage.

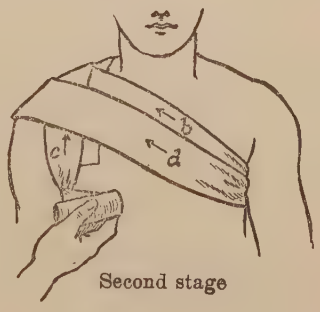


Second stage.

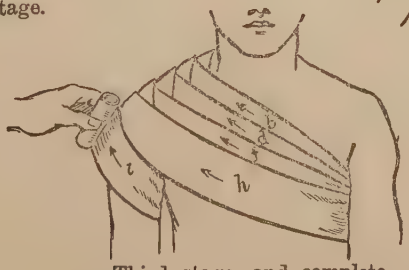
Bandage for finger. The first stage starts round wrist for the purpose of fixing, and passes in an open spiral down to the point of the finger; the second stage passes upward again as a spiral with reverse at each turn, and ends round wrist.



First stage.

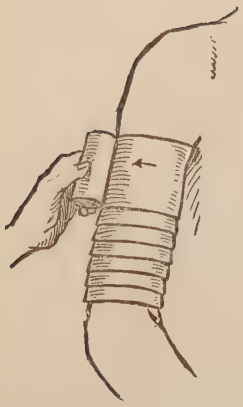


Second stage



Third stage, and complete.

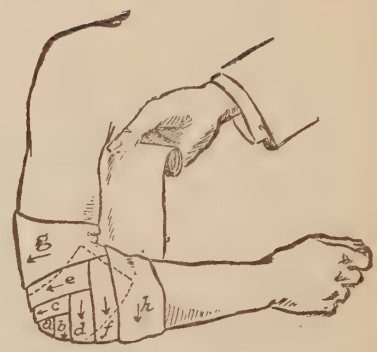
Spica for shoulder or armpit.



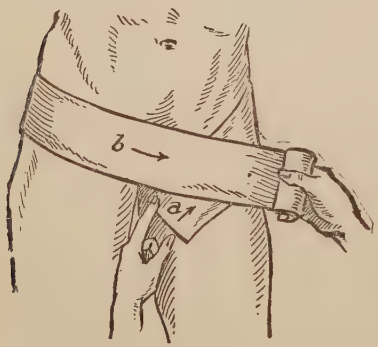
Simple spiral for arm.



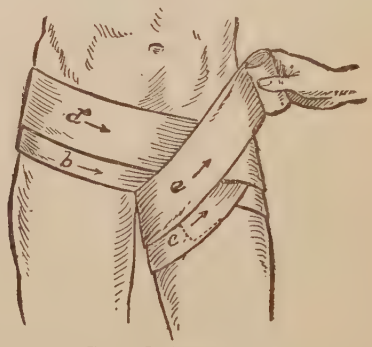
Spiral with reverses for hand and forearm.



Spica for elbow.



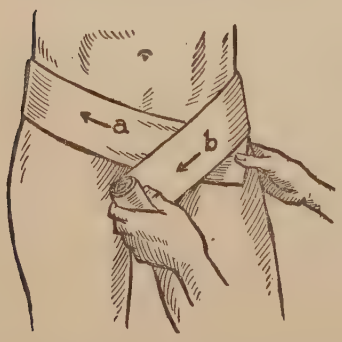
First stage.



Second stage.

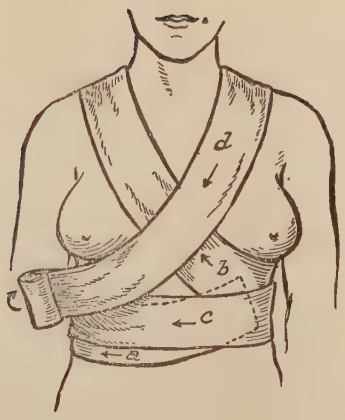
Ascending spica for groin.

Commencement of descending spica for groin. In the ascending spica the bandage runs up across the front of the thigh and each turn is higher than the one before. In the descending spica the turns across the thigh run down and each turn is at a lower level than its predecessor. The body turns pass round the pelvis, not round the waist. When both groins are to be bandaged, a turn of ascending spica on one alternates with a turn of descending spica on the other; after each pair of turns a complete circular turn is made round the pelvis.

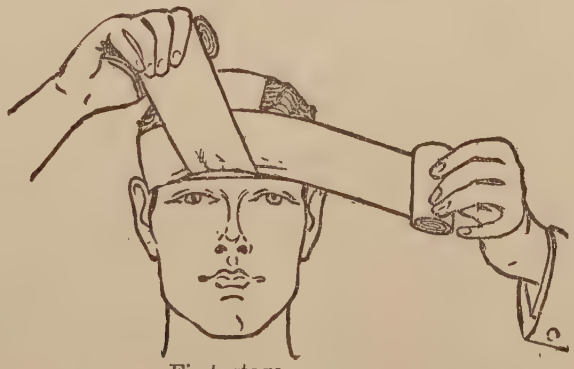




Bandage to fix a dressing on the chest and cover in the arm. In actual practice a wider bandage would be used, and the turns would overlap. For clearness they are here shown separated.



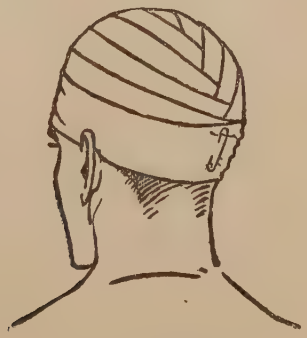
Bandage to support the breasts. A wide bandage is used. After each pair of turns beneath the breasts a circle to fix is taken around the waist.



First stage.



Bandage completed, front view.



Bandage completed, back view.

Capelline bandage for head. Two bandages are stitched end to end. The bandage is rolled off one to the other till one roller is half as large again as the other. The larger part circles round the head close above the eyebrows and ears, and low down on the back of the head, binding down at each turn a strip of the other, which passes alternately backward and forward on either side.

BITES, STINGS, AND POISONED WOUNDS

Bites of animals are in general to be treated as punctured or lacerated wounds, but seeing that animals' teeth are in general foul, suppuration is very apt to arise if the bite be deep. The bite of some reptiles, scorpions, spiders, etc., causes definite symptoms of poisoning, while, after the bites of several animals, especially the wolf and the dog, there is often a risk of hydrophobia.

Dog bites may be treated with any simple dressing, such as carbolic lotion (1 to 40), applied on lint covered with gutta-percha tissue, and the dressing renewed twice daily for a few days, till the wound is clean. If, however, there be any fear of hydrophobia, a physician should immediately be consulted.

Snake bites are not necessarily poisonous, for not only are many snakes harmless, but persons can, like the snake-charmers of India, render themselves immune by the injection under their skin of gradually increasing doses of the poison. The principal poisonous snakes belong to the viper and cobra families, and all inject their poison through a pair of grooved or hollow teeth connected with poison-glands. The symptoms of snake-poisoning are swelling and paralysis of the bitten part, with general depression, palpitation, difficulty of breathing, faintness, and later paralysis and convulsions, followed, in bad cases, by death. The treatment recommended by Calmette is to put a tight band at once between the bite and the body, so as to stop the circulation (the band may be left on for half an hour); to make a cut half an inch deep and one inch long following the bite; to press, wash, and suck the wound; and later to inject, into the tissues around, permanganate of potassium solution (1 to 100 of water) or chloride of lime (two per cent.), which destroys the poison. Whisky, aromatic spirits of ammonia, strong tea, or coffee should be given by the mouth to stimulate the feeble heart. The person

should rest quietly, and, if breathing becomes difficult, artificial respiration should be performed.

Toads and salamanders secrete a milky fluid from the skin of the back which is irritating locally, and which, in small animals and weakly children, is said to kill if introduced by a wound.

Centipedes, scorpions, and tarantulas (large tropical spiders) kill their prey by poison, and can inflict a very painful, though probably seldom fatal, bite on human beings. The treatment is to suck the wound and apply one of the following: vinegar, ammonia, ipecacuanha, spirit of camphor, camphor and chloral rubbed together, tobacco juice, turpentine, or some opiate. If an abscess forms it is to be treated like an abscess from any other cause.

Harvest-bugs, fleas, lice, and mosquitoes often cause great irritation of the skin by their bite. Harvest-bugs may bury themselves in the skin and have to be picked out with a needle. Lice may be got rid of, if on the body, by rubbing with sulphur ointment or white precipitate ointment; undergarments should be boiled, to kill the nits, and those which cannot be boiled should be baked in the oven. If the lice are in the hair, saturate it with petroleum or carbolic lotion (1 to 60) and wear an oilskin cap overnight for three successive nights. They may be got rid of by burning sulphur for several hours. Mosquito bites are soothed by bathing with salt water or painting with aromatic spirits of ammonia, oil, or laudanum, and they may be prevented, to some extent, by smearing the skin with citronella-oil, camphor-water, lime juice, or one of the oils of pennyroyal, lavender, cloves, or cinnamon.

Ants, bees, wasps, and hornets cause great irritation by the stings with which the females and workers are provided. Those of ants are allayed by eau de Cologne or ammonia. Bees, wasps, and hornets sometimes leave a part of their sting, as well as poison, in the skin, and this should be looked for first of all and pressed out. It is popularly supposed that a nest of hornets can sting a man or animal to death. The sting of a wasp in the throat, the insect having been taken into the mouth in biting a fruit, has caused death owing to rapid swelling, which blocks the air-passage. Many things give relief from the pain, such as ammonia, soap, chloral and camphor, tobacco juice, or onion juice locally applied.

Jellyfish and hairy caterpillars, the former by threads which they discharge, and the latter by brittle, poisoned hairs, cause an itchy red rash after contact. It is relieved by vinegar or olive-oil.

Nettle stings are relieved by bruised dock leaves or raw onion juice.

Arrow poison is sometimes dreaded when children have been playing with arrows from the East Indies. Unless, however, the arrow has been actually driven into the flesh, the amount of poison absorbed would probably be insufficient to do any harm. The poison on these arrows is sometimes one causing convulsions, in which the general treatment is that for strychnine poisoning, or more generally it is of the nature of curara, causing paralysis, in which case, if the breathing should begin to fail, the proper treatment would be artificial respiration.

BRUISES—CONTUSIONS

Bruises are more or less extensive injuries of the deeper parts of the skin and underlying tissues, accompanied generally by outpouring of blood from damaged vessels, but unattended by corresponding open wounds.

Varieties.—An extensive bruise may be accompanied by a wound, in which case the injury is known as a contused wound.

The simplest type of bruise is one in which the deeper layers of the skin only are damaged, causing a slight bluish discoloration due to the tearing of minute vessels and the escape of blood into the cellular spaces of the skin. As the result of a severe blow, the muscles may be bruised and torn without any wound in the skin, and the resulting effusion of blood may cause a large swelling which sometimes, though not usually, results in the formation of an abscess. When a bone is bruised, as by a kick on the shin or by a fall upon the knee or elbow, changes similar to those which follow an actual fracture are produced, and a permanent thickening of the bone very frequently results. Bruises of this type are of great importance, because an effusion of blood into the cavity of a joint leads to stiffness lasting some weeks, which may, if absorption of the blood be not complete, remain in some degree permanent owing to the formation of adhesions. Further, it is held by many authorities that some slight injury of this nature is in many cases the starting-point of the tubercular dis-

ease which frequently attacks the bones of children. Severe bruises of internal organs, as from a crush or run-over accident, sometimes occur even when the skin has escaped injury and shows no mark. Bruising of the brain or spinal cord sometimes occurs in consequence of a severe shaking, as in a railway accident, and is known as concussion.

Appearance of a Bruise.—The extent of a bruise and the depth of its tint depend upon the amount of blood which has escaped from the vessels, and this again varies according to the violence of the blow and peculiarities of the person injured. In some diseases, like scurvy, extensive bruises are produced by little or no violence. Sometimes a bruise is so sharply limited that it gives a distinct impression of the instrument with which it has been inflicted, while in other cases the blood runs downward and produces a black mark at some distance from the injured part, as seen, for example, in the blackness beneath the eye which may follow an injury of the forehead or temple.

The color of a bruise is at first black or bluish, later becoming brown, and finally changing to yellow, which fades away as alterations take place in and absorption occurs of the blood pigment. The time occupied in disappearance of a bruise depends largely upon the amount of blood effused, but in moderate bruises ten days or a fortnight must elapse before the injury ceases to be noticeable.

Treatment of slight bruises consists chiefly in preventing the effusion of blood after an injury, by means of cold compresses firmly fixed in position by suitable bandages. Ice may also be applied with good results. If it be not convenient to apply cold, various astringent substances may be used in the form of evaporating lotions kept in contact with the part for eight or ten hours; or the skin may be painted with hazeline or tincture of arnica. In painful bruises one of the best applications is lead and opium lotion. The injured part, if a limb, should be elevated in a sling or on a couch. After the first day or two, when no more effusion will take place, gentle massage away from the bruise toward the body helps absorption and loss of the discoloration.

Mere surface bruises and abrasions are benefited by application of hazeline, or if the skin be much ruffled or ingrained with dirt it is well to apply for a few days a piece of boracic lint in the form of a water-dressing.

BURNS AND SCALDS

Burns are injuries caused by dry heat, scalds by moist heat, but the two are similar in symptoms and treatment. Severe burns are also caused by contact with electric wires, and by the action of acids and other chemicals.

Degrees of Burns.—The French surgeon Dupuytren divided burns into six degrees, according to their depth.

1st Degree. There is simply redness. Such burns may be painful for a day or two.

2d Degree. There is great redness, and the surface is raised up in blisters. There is much pain, but healing occurs without a scar.

3d Degree. The scarf-skin, or epidermis, is all peeled off, and the true skin below is in part destroyed, so as to expose the endings of the nerves of sensation. This is an excessively painful form of burn, and a scar follows on healing.

4th Degree. The entire skin is destroyed, with its nerves, so that there is much less pain than in the last form. Not only does a scar result, but it contracts later and may produce great deformity.

5th Degree. The muscles also are burned, and still greater deformity follows.

6th Degree. A whole limb is charred. It separates as in gangrene.

Symptoms.—For the first two days the chief symptoms are pain, varying with the degree of the burn, and in severe cases the condition of lowered vitality called shock. It is said that even superficial burns of as much as one third of the skin-surface are always fatal. After forty-eight hours, in cases of the third and higher degrees, inflammation of the part and fever are very apt to come on, and in extensive burns over the head, chest, or abdomen, there is great risk of inflammation in the membranes covering the internal organs beneath the burn. Later, when the burnt parts slough away, there is much suppuration until the gap finally heals. All through this stage there is, in extensive burns, a liability to death from ulceration of the bowels. Healing is slow, and if the burn is deep, as above stated, there is often terrible deformity.

Treatment.—Very trifling burns are soothed by applying soap or by running tepid water over the burnt part. For severer burns there are three sorts of application: (1) *Dry dressing.* This consists of a dusting-powder of flour, starch, or starch and boracic acid in equal parts, which is powdered thickly on the burn, the part being then wrapped in absorbent cotton. Or muslin is wrung out of a saturated solution of picric acid in water and laid on the burn, which it hardens and dries. Or the burn is washed thoroughly (under an anesthetic) with perchloride-of-mercury solution and dressed with antiseptic wool. (2) *Wet dressing,* either of soda lotion consisting of two teaspoonfuls of baking-soda to a tumblerful of tepid water, out of which clean lint is wrung and applied covered with oil-silk, or boracic acid lotion (1 to 30) similarly applied. (3) *Oily dressings,* of carron-oil containing lime-water and linseed-oil in equal parts, or lime-water and a mixture of eucalyptus-oil with olive-oil, or of boracic ointment spread on lint.

Before the dressing is applied the charred remains of the clothes must be removed gently and in small pieces, after soaking in tepid water or oil, because the burnt skin often sticks to them. If the burn be large, and a doctor is to see it, no oily application should be made beforehand, because oil is very difficult to remove if it is desired to change the type of dressing, but there is no harm in applying soda or boracic lotion at once. For small burns carron-oil is very soothing. When suppuration is going on, boracic lotion is perhaps best, and when healing is advancing boracic ointment on lint may be used.

Children sometimes scald the mouth and gullet by drinking from the spout of a kettle; and for this, teaspoonful doses of a mixture of cod-liver oil and lime-water, from time to time, give relief.

The shock accompanying a bad burn must be treated by stimulants, and later by stimulating diet.

CLOTHING AFIRE

Everyone should know how to deal with a person whose clothes have caught fire. Throw the person on the ground at once, on his face if it is the clothes of his back which are burning, on his back if the fire has attacked his clothes in front. This is done

because the flames always rise, and are so turned away from the body. The flames must be subdued by excluding the air. Cover the patient with a rug, table-cloth, overcoat, blanket, or any such heavy substance, and roll him about in it. Get the windows and doors closed so as to prevent free access of air to the flames as far as possible. In addition to this, water may be freely thrown over the person, not only to extinguish the flames but to cool the smoldering clothes. The clothes should be removed as soon as the flames have been overcome, and the patient placed in a warm bath.

DROWNING

In drowning, death as a rule ensues from asphyxia, though, in falls from a height upon water, or in cases where the body in falling has encountered blows upon the head or abdomen, death may be due to shock. In the latter case, instead of the signs of asphyxia, the skin is pale, face placid, and the lungs are empty of water, because no attempts at breathing have taken place. In slight cases of shock the chances of resuscitation are rather more hopeful than in cases of asphyxia, because little water has been drawn into the lungs, and because there has been no struggling. It must be remembered that complete deprivation of oxygen results in death after three to five minutes, and therefore recovery is unlikely if the submersion under water has lasted longer than a few minutes. Therefore speed and immediate treatment on withdrawal from the water are of paramount importance.

The specific gravity of the body being slightly greater than that of water, it sinks at first, then if the person is able to struggle his efforts bring him to the surface, where he remains so long as he can swim, only to sink again as he becomes exhausted. This may be repeated several times, though the popular idea fixes the permanent disappearance at the third time. In these struggles, water mixed with air is drawn into the air-passages, and the two are churned up with mucus into a froth which forms a great obstacle to the entrance of air into the lungs during subsequent attempts at resuscitation. The first step in this process should be commenced *on the instant the body is drawn from the water,* without delay for any examination, removal of clothing, or the like, and consists in the attempt to restore breathing by *artificial respiration.* The same methods of artificial respira-

tion are applicable to other cases of asphyxia produced by inhalation of poisonous gases, or by mechanical obstruction, such as hanging, strangling, or choking. Four methods are available for this purpose:

Marshall Hall's Ready Method is valuable for two reasons: first, because it frees one lung thoroughly from its frothy water; and second, because it is a very easy and simple method. A roll about six to eight inches thick is made, for example, out of a rolled-up coat and vest, or a large stone or spar of wood may be used for the purpose. Upon this the chest of the patient is placed face downward, and firm pressure made with both hands upon the back to expel air and water. Then the body, grasped by the shoulders, is turned steadily upon one side, still lying upon the bundle or stone, so that one lung is expanded. Then the body is turned again upon the face so that the air is expelled from the chest, and so forth, each movement being repeated about fifteen times per minute. It is important always to turn the body upon the same side, otherwise water is apt to run from the lung which was previously the lower one, and again choke up the air-passages of the one which has been cleared.

Howard's Method is a much more effective method, but requires considerable skill, and is therefore not suitable for an untrained person. It is the method in which lifeboat-men, firemen, etc., are trained in this country. It is performed in two stages.

(*a*) To free the air-passages of water. Place the body face downward, with forehead on forearm so as to keep the mouth off the ground, and with a *large* tight roll of clothing beneath the pit of the stomach. Let the operator lean for a few seconds heavily upon the back of the patient with his left hand placed over the lower ribs on the patient's left side, and his right hand over the spine lower down, and let him end this pressure with a push. Repeat this two or three times according to the probable amount of water and froth to be expelled.

(*b*) To reëstablish breathing. Place the body face upward with the large roll of clothing beneath the chest, so that the shoulders incline slightly downward but do not touch the ground; bend the head and neck as far back as possible, and place the hands above the head, where the wrists may, if necessary, be fastened together. The waist and chest must be free of clothing. Let the operator now kneel astride of the patient at the level of

in by this method is about 6760 cubic centimeters, an amount far in excess of that possible by the Silvester or Marshall Hall method. While in the Silvester method force is employed to produce inspiration as well as expiration, in Schäfer's method, as in Howard's method, the force is used only to compress the chest, and the chest is allowed to expand by its own elasticity, and draw air into the lungs.

Immediately on removal from the water, place the patient face downward on the ground, with a folded coat under the lower part of the chest, and lose no time by removing clothing. Turn the patient's face a little to one side, so that the mouth and nose are not obstructed. Let the operator kneel astride of or to one side of the patient, facing his head, and let him place his hands over the lower part of the patient's back, one on each side (on the lowest ribs). Let him throw the weight of his body forward upon his hands, so as to press the air (and water if there is any) out of the patient's lungs. Then let him immediately raise his body to take the pressure off and allow the patient's chest to expand. Repeat these movements twelve or fifteen times per minute.

After-treatment for Drowning.—As soon as the patient makes efforts at breathing, these measures are stopped. But no such effort may be made for twenty minutes, an hour, or even in some recorded cases for several hours, and still the person may recover, so that artificial respiration should be persevered with so long as there is the slightest sign of life. Efforts must then at once be made to restore the feeble circulation, and, in cases where the body has been long in water or much exposed during artificial respiration, to regain the body warmth. To this end the patient should be wrapped in hot blankets, with hot bottles to the sides and feet, and the arms and legs should be energetically rubbed upward toward the body. So soon as the power of swallowing returns, sips of hot water, and teaspoonfuls of hot brandy and water, or hot coffee, may be administered. When the heart continues feeble, and indeed during the performance of artificial respiration, but not in such a way as to impede the latter, which is of paramount importance, hot sponges may be applied to the front of the chest over the heart, or a galvanic current passed through the chest. Ammonia, nitrite of amyl, or smelling-salts may for the same purpose be now and then held to

the nose. Finally, if the patient shows a tendency to sleep, this should be encouraged.

ELECTRIC SHOCKS

With the great development of the use of electricity both in public and private life, it is much commoner now than formerly to find persons suffering from shock caused by contact with "live" wires. A live wire is one along which an electric current is passing, and though usually insulated by some suitable material or, as in the case of overhead trolley wires, placed in a position so as to be out of reach under ordinary circumstances, accidents may happen when the insulating material is defective or worn away or the uninsulated wire is exposed to the touch through a breakage or injury to its supports. At the point of contact with the body there may be a serious burn; of more immediate danger is the general condition of the patient owing to the passage of the electric current through the body. This must be stopped as soon as possible. Where it is possible to turn off the current, this must be done. In many cases, however, this is either impossible or would entail too great a delay. The patient must then be removed from contact with the live wire. He may be unable to do this of his own accord because he has been rendered unconscious, or because the muscles of his arms are so affected by the current, in a case where the hands are in contact with the conductor, that he is unable to use his arms voluntarily. He must then be removed by force.

Remember that the human body is a conductor of electricity owing to the amount of moisture or fluid in the body, and that consequently the person in contact with the live wire is, as far as the current is concerned, practically a part of the wire. Care must be exercised, then, by the person about to render aid that he, too, is not placed in a like condition of danger. To do this he must prevent the current passing through his body, by insulating himself from the earth and from the patient. The best non-conductor is glass, on which the rescuer should stand. A couple of bottles may be used, or a pane from a window. India-rubber is also a good non-conductor, and some may be available in one form or other. Other substances may be used, such as wood, bricks, silk, cloth, hay or straw, all of which, when dry,

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are non-conductors. Moisture in any form is a splendid conductor of the electric current, and any substance which, when dry, is a non-conductor becomes a conductor if moistened or damp. This applies to all the above. The presence of moisture renders them useless for the purpose required: they can only be effective when dry.

The person in this way insulated from the ground may now pull the patient away from contact with the live wire. The hands should be insulated before applying them to the patient or to the wire. Rubber gloves, being the ideal insulator, are not likely to be available—recourse must be had to other means which are. Any piece of cloth or article of clothing which is dry may be used; a rubber tobacco-pouch is a splendid substitute for the desired, but unavailable, rubber gloves; dry paper may be used in the form of a newspaper, or some pages of a magazine. A rug may be caught by two opposite corners and thrown over the patient's head as a loop, and his body so pulled away from danger. If a portion of dry rope is available, it may be used in a similar manner, or a wooden walking-stick with a crook handle may be used to pull the patient away. Nothing in which there is any metal should be used, as this, of course, is an excellent conductor.

Treatment.—The patient, when removed, may be found merely to be suffering from shock, in which case he should be kept lying on the ground well covered with warm clothes. Some stimulant may be given. If the shock and collapse are severe, and the breathing is interfered with, the clothes about the neck and chest must be removed, and the patient stimulated by means of cold water on the chest and face and brisk rubbing with rough cloths. If necessary, one or other of the methods of artificial breathing should be employed to restore animation, and the patient treated as has already been fully described. Any burns, if present, must be attended to. The patient should always be seen by a physician, in case there are any further injuries.

FAINTING

Fainting, or syncope, is a temporary loss of consciousness associated with feeble action of the heart.

Causes.—The manner in which the loss of consciousness is produced appears to be that the feeble heart is unable to pump

blood up to the brain, thus causing anemia of that organ, and rendering it unable to act. If the person who threatens to faint lies down, or, still better, if she sits and then bends forward so as to bring the head below the knees, the faint is averted. The feebleness may be due to some long-standing heart disease, which through an overstrain suddenly reaches a climax. Or it may be part of the general muscular relaxation which takes place in a hot bath, fainting in a bath being sometimes a cause of death in weak persons. Powerful emotion, generally of a sorrowful nature, but sometimes even great joy, is a very common cause. Extreme pain, such as that due to the crushing of a limb, and shocks to the nervous system, such as a blow on the head or on the abdomen, are very apt to cause fainting, or even the more serious condition known as shock. Disgusting smells and sights, breathing of bad air, and general exhaustion are also causes. As a rule, a combination of these causes is necessary, except in hysterical persons and persons weak from some illness, who are specially liable to faints. Certain drugs which depress the heart's action, such as tobacco or chloroform, when taken in large amount, produce syncope.

Symptoms.—There are certain warning symptoms of fainting, such as pallor, feebleness of the pulse, a sinking feeling, and a dullness of sight and hearing. When the faint has occurred, the person lies still, breathing very faintly, with feeble pulse, pallid complexion, and often perspiration standing in drops on the face.

The faint, as a rule, lasts only a few seconds or minutes, but it may last for hours, and hysterical persons may pass from one faint, only to fall into another, several times.

Treatment.—The faint may often be prevented by attending to the cause. The person in a faint should be laid flat on the back, and care should be taken that breathing is unimpeded. If care be not taken to leave the fainting person lying flat, death may ensue, but if this be attended to, nothing more is usually necessary. Stimulants may be applied to the skin in the form of cold compresses on the head, slapping of the hands, pinching of the cheeks; or they may be applied to the nose in the form of smelling-salts or eau de Cologne, or the pungent fumes of burnt feathers.

FITS

Definite fits occur chiefly in epilepsy and hysteria. Fits very like those of epilepsy occur also in general paralysis of the insane, and sometimes in cases of brain tumor. Convulsions in children are fits not unlike those of epilepsy. Sometimes these are due to disease of the nervous system; more commonly they are due to some kind of irritation in weak or rickety children; or they may be the equivalent of a shivering fit or rigor in an adult at the commencement of some feverish attack. Tremor—a more or less constant, fine, shaky movement in the muscles of the limbs, or of any part of the body—may be seen in conditions of temporary fatigue, in exophthalmic goiter, in disseminated sclerosis (a disease of the brain and spinal cord), in chronic alcoholics or in acute delirium tremens, in old people without any definite disease, and in paralysis agitans, or the shaking palsy, in which the movements generally commence with the characteristic pill-rolling movement of the thumb and forefinger.

Treatment.—Lay the patient flat on his back, and keep the teeth separated by a pad made of cloth or some other suitable material. Sprinkle the face and chest with cold water, and endeavor to have him inhale the fumes from a smelling-salts bottle. It has also been found that by forcing common table salt into the patient's mouth quick relief has resulted.

FRACTURES

Fractures are breaks in the structure of bones produced by violence.

Varieties.—The great division of fractures is into those which are simple and those which are compound.

Simple fractures form the commonest variety, consisting of those in which the bone is broken, with or without much laceration of the surrounding parts, but in which there is no wound leading from the fracture through the skin.

Compound fractures are those in which the skin is injured, so that a wound leads from the outer air to the broken bone, which may indeed protrude through this wound. The fact that a fracture is compound renders it very much more serious, even


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FRACTURES OF THE BONES

FIG. 1—Fracture of the shaft of the radius, showing outward rotation of the upper fragment by the biceps and suggesting the necessity of splinting the forearm in full supination (rolling forearm outward with palm upward).

FIG. 2—Longitudinal section of lower end of radius showing Colles' fracture.

FIG. 3—Similar specimen as Fig. 2.

FIG. 4—Diagram showing the bone lesion in Fig. 5.

FIG. 5—Lateral displacement in Colles' fracture. Projection of the ulnar styloid process.

FIG. 6—Old fracture of both bones of the forearm. The bones are united by exuberant callus.

FIG. 7—Coronal section, showing the epiphyses at the lower ends of the bones of the forearm.

FIG. 8—Coronal section through the elbow joint, showing epiphyseal development of the capitellum, the internal epicondyle, and the head of the radius.

FIG. 9—Sagittal section of the ulna of a child, showing the epiphyseal cartilage in which the bony nucleus of the olecranon appears during the tenth year.

FIG. 10—Ankle joint laid open after Potts' fracture, showing points of fracture and dislocation.

FIG. 11—Oblique section showing tibial and fibular fractures of the bones of leg and outward displacement in Potts' (ankle) fracture.

though there be little splintering of the bone or laceration of the soft tissues. The special dangers attending compound fractures are as follows. The bleeding is apt to be much greater than in simple fracture, and a large quantity of blood may be lost. The union of the bone is much delayed, repair taking place by a much slower process when there is an open wound, and a lengthy illness is the result. The greatest danger, however, is that the wound may become infected with virulent microörganisms, so that suppuration, erysipelas, or blood-poisoning may ensue, and amputation of the limb may become necessary. The long illness, accompanied by suppuration, may also permanently impair the injured person's health. For all these reasons, the greatest care is necessary in handling a fractured limb, so that a simple fracture may not be converted into a compound one.

Complete fractures are those in which the bone is broken completely across, and no connection left between the pieces.

Incomplete fractures are those in which the bone is broken only partly across, or in which the periosteum, the tough membrane surrounding the bone, is not torn. This variety occurs in children, whose bones contain more fibrous material and less bone earth than those of old people, a fact which renders them tougher and more pliant in earlier life. A child's bone may, like a twig, crack half-way across and then split some distance up its length, suffering in this way what is called a "green-stick" fracture.

Fissured fractures are mere cracks in the bone, and are found most commonly in the skull. A simple fissured fracture of the skull is probably a fairly common accident.

Depressed fractures also occur generally on the skull, and consist of fractures in which a fragment of bone is forced inward below the general level. This may give rise to serious injury of the brain either when the fracture is produced, or at a later date from the thickening consequent on repair of the bone.

Complicated fractures are those in which, in addition to the fracture, some other serious injury is produced, for instance, a dislocation, tearing of a nerve, etc.

Comminuted fractures are those in which there is much splintering.

Impacted fractures are those in which, after the break has oc-

curred, one fragment is jammed inside the other, usually at an angle.

Ununited fractures are those in which, after the usual time has elapsed in which the fracture mends, it is found that union has not taken place. The failure to unite may be simply due to "delayed union," in which the process of repair is proceeding slowly on account of ill health, or of damage to the chief artery which supplies the bone with blood, or usually in consequence of the fact that the fractured limb is not kept sufficiently at rest. Or there may be actual failure of the healing process to take place. In the latter case, the ends of the bone are thoroughly rubbed together under chloroform, and the fracture again set. If this produces no good effect, an operation is usually performed, in order to remove any piece of muscle which may have got between the ends or to fasten the ends with wire.

Malunited fractures are those which have not been properly set, or in which displacement occurs after setting, so that the bone is twisted, or united with a neighboring bone, as sometimes happens after fracture of the forearm, or is enlarged and shortened, or does not unite by bone, but forms what is known as a false joint. Sometimes malunion is unavoidable, owing to spasm of muscles, or to production of an excessive amount of new bone.

Treatment.—After the fracture has been recognized, a certain amount of temporary treatment is advisable till the broken bone can be properly fixed in place by a surgeon, and in the following descriptions the temporary treatment will be given, short reference being made to the permanent treatment where it differs from the temporary.

A compound fracture is treated first of all as a wound by cleansing and by dressings, and then as a simple fracture. It is particularly necessary that the skin around should be well cleansed, and the wound itself is often very dirty. A thorough washing and scrubbing of the wound (under an anesthetic) is usually necessary, and some surgeons fasten the fragments with silver wire or plates.

For temporary treatment the splints, etc., may be applied above the clothes in the case of simple fractures, and little padding is then necessary. But for a compound fracture the limb must be exposed, the wound dressed, and then the splints

have to be carefully padded. In the permanent treatment the limb is bared, and the splints padded with absorbent cotton.

For permanent treatment the fracture must first of all be "reduced," i.e., the broken ends must be brought accurately together, then it must be "set," i.e., the ends firmly fixed in good position, and finally it must be kept at rest, with attention to the patient's general health, till union has taken place. Reduction is effected usually by one person, who pulls gently and steadily upon that part of the limb beyond the fracture (extension), so as to overcome the shortening and bring the ends a little apart from one another, in order to prevent grating, and so avoid pain. At the same time a second person should steady the limb above the seat of fracture (counter-extension). This they maintain while a third person applies the necessary splints, bandages, etc. For keeping the bone in position, various devices, such as bandages, plaster, cradles, splints of wood, leather, or poroplastic felt, and extension by weight and pulley are adopted. Splints are generally made from strips of wood, about a quarter of an inch thick, but they may be improvised from bundles of twigs, broom-handles, rifles, folded-up newspapers, and many other rigid articles. Care must be taken, especially in old people confined to bed for a fracture, that no bed-sores form, and various tonics are often necessary. In the case of fracture of the lower limbs, it is a very general practice to keep the person in bed with the limb fixed by ordinary splints for two or three weeks, and then to apply a case of plaster of Paris to the whole limb, and allow the patient to get up and go about with crutches.

HANGING

Hanging is a form of death due to suspension of the body from the neck, either suddenly, as in judicial hanging, so as to damage the spinal column and cord, or in such a way as to constrict the air-passages and the blood-vessels to the brain. Death is in any case speedy, resulting in two or three minutes, if not instantaneous, though in bygone days criminals who were "shored-up," or supported by their friends, have come round after half an hour's suspension. The mark of the noose on the neck is oblique in hanging, which serves to distinguish this form of death from strangling, in which the mark is circular. The question as to

accident, suicide, or murder does not generally arise in cases of hanging, which, apart from judicial hanging, and in the absence of any signs of a struggle, is due to suicide. The means for resuscitation of persons found hanging is similar to that for drowning.

HEMORRHAGE

Hemorrhage means any escape of blood from the vessels which naturally contain it. It may occur from a wound of the skin, in which case it escapes externally, or into some internal cavity such as the stomach or bowels, or may simply be poured out into the tissues in consequence of a blow or similar injury, but, in all cases alike, the blood escaping from the vessels is lost to the circulation. Hemorrhage is classified according to the vessel or vessels from which it occurs, as: (*a*) *arterial,* in which case the blood is bright and appears in jets or spurts, corresponding to the heart-beats; (*b*) *venous,* when it comes from veins, is dark, and wells up gradually into the wound; (*c*) *capillary,* when it flows merely from torn capillaries, and comes in a gentle ooze out of the general surface of the wound. The immediate result of a severe hemorrhage is great anemia, so that, in extreme cases, the bodily organs may be unable to continue their functions, and the person dies in consequence, with symptoms of shock.

In general, arterial hemorrhage is the most serious, and if a large artery, such as the femoral, be wounded, the person concerned may bleed to death in a few minutes. Venous hemorrhage is so easily checked by slight pressure, and the valves in the veins so effectively prevent blood from running backward in these vessels, that this form is not dangerous to life except in the case of ruptured varicose veins of the leg, or when a serious internal injury is received. Capillary hemorrhage stops so quickly, that only in the case of the disease known as hemophilia is it of serious import. The following terms are applied to hemorrhage from special sites: hematemesis, bleeding from the stomach; hemoptysis, bleeding from the lungs; epistaxis, bleeding from the nose; and hematuria, bleeding from the kidney or urinary passages. Hemorrhage is also classed as primary, reactionary, and secondary.

Natural Arrest.—When an artery of small size is cut across, the bleeding stops in consequence of changes in the wall of the artery on the one hand, and in the constitution of the blood upon the other. Every artery is surrounded by a fibrous sheath, and, when cut, the vessel retracts some little distance within this sheath, in consequence of the shortening of its muscle-fibers, and further, by the same process, the end contracts so as to form an opening of smaller size than the rest of the vessel. In the space between the end of the vessel and its sheath, and afterward for some distance up the interior of the narrowed artery, blood-clot quickly forms by the following process, and rapidly blocks the open end of the vessel. When blood is shed so as to come in contact with any surface other than the smooth lining of blood-vessels, the fibrinogen which is dissolved in its fluid becomes suddenly converted into threads of fibrine through combination with the lime salts of the blood, and the action of a ferment given off probably by the white blood-corpuscles. These threads of fibrine slowly contract and develop into a dense felt-work, in the meshes of which the corpuscles are held, and in this way a blood-clot of increasing hardness is produced, within and round the ends of the injured vessels. When an artery is only partially severed it is evident that "contraction" and "retraction" within the sheath cannot take place, and accordingly bleeding is apt to be more serious than when the vessel is completely cut across. Again, if an artery be torn across or twisted instead of cut, the opening at its end is still more narrowed, and the blood clots more rapidly on the ragged surface than it would do upon a clean cut, so that hemorrhage from a torn or bruised wound is in general much smaller in amount than from a stab or cut. The natural arrest of bleeding is usually described therefore as depending upon four factors: (*a*) the retraction and (*b*) the contraction of the cut artery; (*c*) the external and (*d*) the internal clot formed by the blood.

Control of External Hemorrhage.—Four main principles are applicable in the control of a severe external hemorrhage: (*a*) direct pressure on the bleeding point or points; (*b*) elevation of the wounded part; (*c*) pressure on the main artery of supply to the part; (*d*) application of substances known as styptics, which contract the vessels or aid the coagulation of the blood.

(*a*) *Direct pressure* may be made with the finger, which is the

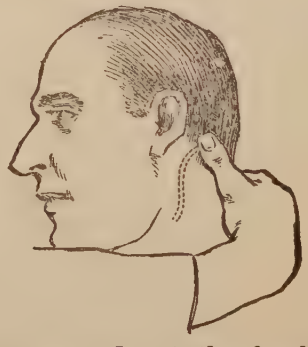
best method, when a definite bleeding spot is seen in a gaping wound. This is the method adopted at an operation by the surgeon, who places his finger at once upon any bleeding spot, afterward seizing the cut artery with forceps and tying a piece of silk or catgut tightly round its end. If the artery lie between the skin and a hard surface, as in the case of scalp wounds, a wedge-shaped pad and tight bandage (known as a "graduated compress") may be substituted for pressure with the finger, the edges of the wound being compressed between the pad and skull.

(*b*) *Elevation* of the bleeding member is an important method, the blood running off more readily by the veins, and a smaller quantity being driven into the limb the higher it is raised. This method is applicable, of course, only in cases of bleeding from the hand or foot.

(*c*) *Pressure upon the main artery* of supply to the injured limb is a certain method of stopping the circulation and consequently all bleeding, much after the manner of stopping the water-supply of a district by closing the main pipe. At certain points where the arteries lie close to bones and near the surface, the pulsation of the vessel may be felt, and *pressure with the finger* over the artery serves to obliterate it against the bone, the points where this may be adopted being as follows.



In cases of bleeding from the upper part of the scalp, the temporal artery may be felt and compressed immediately in front of the upper part of the ear.



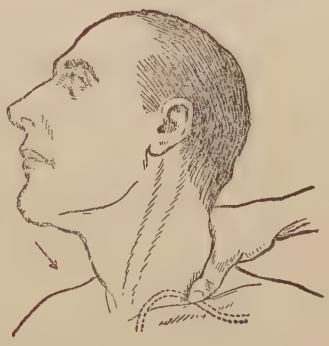
For wounds at the back of the head, the occipital artery can be felt and compressed a short distance behind the mastoid process, the bony prominence at the back of the ear.



Bleeding from the face may be checked by pressure on the facial artery, which passes on to the face about an inch in front of the angle of the jaw, across the jaw-bone, against which it is to be pressed.



All bleeding from the head and neck may be lessened by pressure upon the common carotid artery in the neck a short distance below the prominent Adam's apple, and between it and the edge of the large sternomastoid muscle. In this groove, the artery is pressed straight back against the transverse processes of the spinal column.



Bleeding from the region of the shoulder and armpit is checked by pressure on the subclavian artery, the pressure in this instance being applied with the thumb directly downward in the hollow behind the middle part of the collar-bone, so as to press the artery down upon the first rib, thus checking the bleeding.



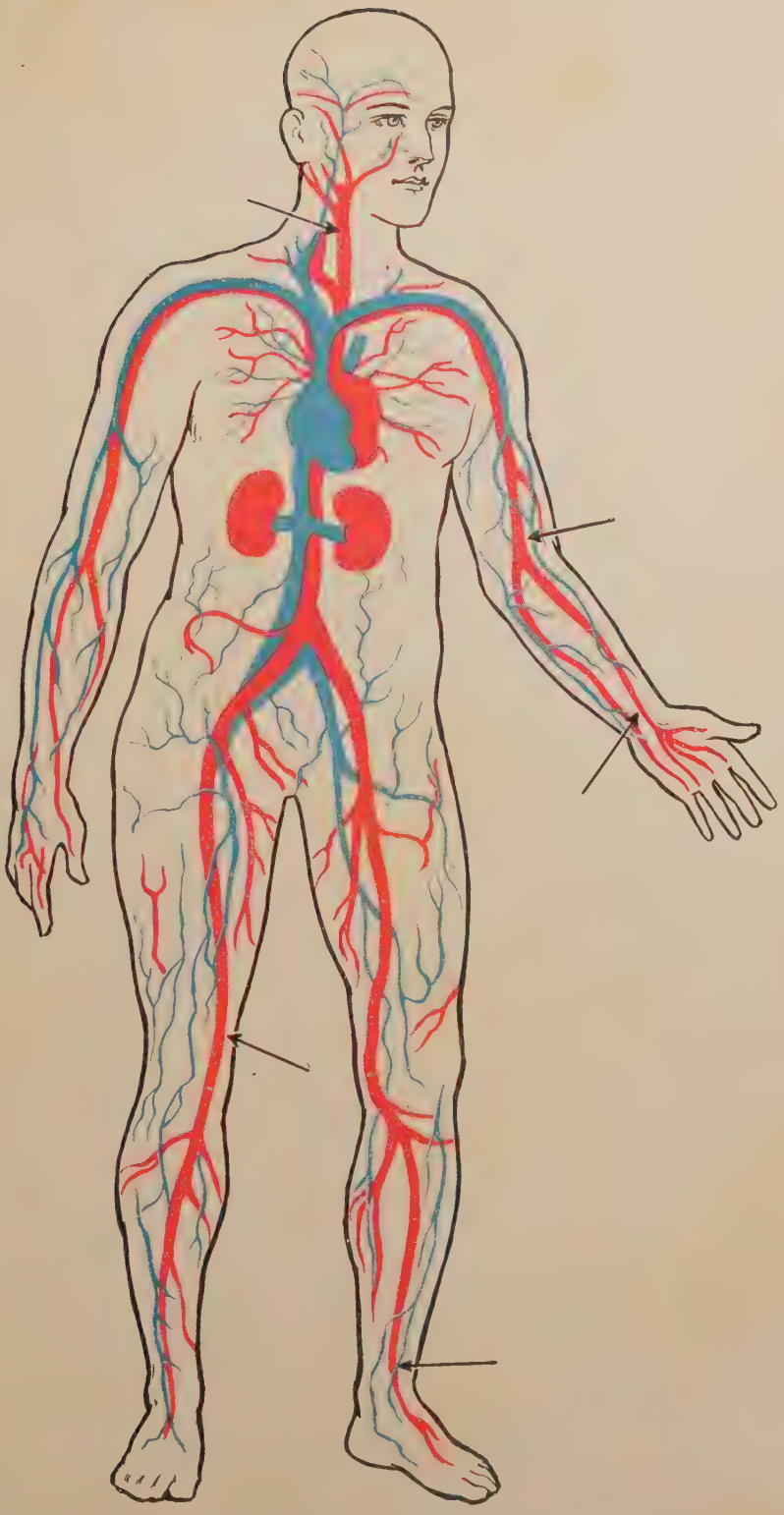
Bleeding from the region of the elbow or forearm may be controlled by feeling for the brachial artery on the inner side of the upper arm, behind the biceps muscle, and pressing the artery against the arm-bone.



Bleeding from the hand is checked by pressure on the radial artery, where it lies between the skin and radius in front of the wrist, and on the ulnar artery just before it enters the hand near its inner margin.

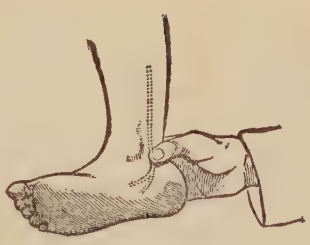


In the lower limb the arteries lie deep among the muscles, but bleeding from any part of the limb may be checked by pressure backward on the femoral artery, which is to be felt pulsating in the center of the groin, and which is compressed against the head of the thigh-bone.



Bleeding can be stopped by pressure on the arteries
as indicated by the arrows

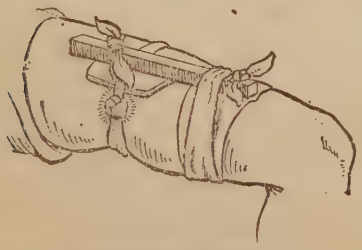
Bleeding from the sole of the foot may be controlled by pressure on the posterior tibial artery, which lies about half an inch behind the inner ankle.





Another method for applying pressure on the main artery consists in *forced flexion* at the elbow, hip, or knee, as the case may be. A pad is placed in the bend of the joint, which is then flexed as completely as possible and firmly bound in this position, the artery being thus sharply bent upon itself.

Still another method for control of the main blood-supply is by the *tourniquet,* which consists of an elastic band or ligature passed round a fleshy part of any of the limbs, and pulled or twisted tight. A surgical tourniquet consists of an india-rubber cord or band with an arrangement for fixing the ends together, or of a strap with buckle and a screw appliance for tightening it up. A tourniquet may, however, be improvised from a piece of rope, or a handkerchief folded cravatwise, tied round the limb and then twisted up tight by a piece of wood, large key, or similar object introduced beneath it.



Tourniquet for leg.

The handle of such a tourniquet is prevented from untwisting by passing a second band round the limb and including the end of the handle within it before tying. A tourniquet may be applied to the fleshy part of thigh, leg, upper arm, or forearm. The application of a tourniquet is slightly painful, but this may be almost entirely prevented by raising the limb before it is applied, in order to empty the veins of blood.

Occasionally, when bleeding is continuous or when it is from a deep-seated wound like a stab, or injury to the root of the tongue, it is impossible to get at the bleeding spot, and permanent control of the bleeding is only to be achieved by the surgeon, who cuts down upon the main artery of supply and ties a ligature round it.

(*d*) *Styptics* are applied when the bleeding is a general ooze from a wound, or when the bleeding comes from an inaccessible position, such as the interior of the nose or a wound in the side. The most important styptics are heat and cold. Though moderate warmth greatly increases bleeding, ice-cold water and also water between 115° and 120° F. (i.e., a temperature which the hand can hardly bear) both favor clotting and contract the blood-vessels. Heat is much more effectual than cold, if applied directly to the wound. Various drugs, such as perchloride of iron and hazeline, act similarly. Extracts made from the suprarenal glands of sheep and known by various names, such as adrenalin, renaglandin, suprarenalin, have a most powerful action in contracting vessels and stopping bleeding, being now much used in surgery.

Control of Internal Hemorrhage is not to be so certainly achieved as in the case of bleeding from the vessels of the limbs. There are certain general principles to which it is most important to adhere. Chief among these is the maintenance of the recumbent position, since the heart beats less forcibly and the blood-pressure is consequently lowered as soon as the injured person lies down. For the same reason, all excitement must be avoided, and the mind of the sufferer quieted as far as possible. Stimulants must, above all, be avoided; and if the person shows a disposition to faint, this is a healthy symptom, as the circulation during a faint becomes still weaker, and the bleeding therefore slackens. Ice-bags or compresses wrung out of cold water may be laid over the chest or stomach, according to the origin of the hemorrhage. Various drugs are administered, such as morphia, by hypodermic injection, for its quieting effect; gallic acid when the bleeding is from the kidneys, the organs by which this drug is excreted; adrenalin when the bleeding is from the stomach, into contact with which the drug comes at once; and volatile oils, like turpentine and camphor, which are said to favor clotting by rapidly increasing the white corpuscles of the

blood, when the hemorrhage is from the lungs. Styptics are of special use in bleeding from the bowels or womb. In the former case, gallic acid or perchloride of iron is given by the mouth, or injected into the bowel if the site of the bleeding is low down. In the hemorrhage which sometimes follows childbirth, vaginal douches of hot water form one of the usual means employed, or plugs of absorbent cotton steeped in tincture of perchloride of iron or adrenalin solution are introduced, and these, combined with pressure, seldom fail to arrest the bleeding.

It should be mentioned that in operations on internal organs or other highly vascular tissue, in the case of which bleeding would be very hard to stop, the cautery is often used instead of the knife, and not only removes the part desired, but, by its heat, prevents all bleeding

Treatment of Bleeding from Special Sites.—*Nose.*—Keep quiet, lying or sitting; loosen collar; no blowing of nose; cold key or sponge to neck; if these be not successful, plugging of nostrils with lint soaked in tincture of perchloride of iron or adrenalin.

Tongue.—Ice to suck; pressure with the fingers; if serious, compression of carotid artery.

Face or Scalp.—Direct pressure with fingers or bandage and pad on wound; if bleeding be severe, pressure in addition on facial, temporal, or occipital artery.

Neck.—Pressure on carotid artery.

Armpit or Shoulder.—Pressure applied to the subclavian artery.

Forearm.—Pressure on brachial artery by fingers, tourniquet, or forced flexion at elbow.

Hand.—Elevation and direct pressure with pad and bandage; if bleeding be severe, pressure on radial and ulnar arteries, or tourniquet to forearm.

Thigh.—Pressure on femoral artery at groin; tourniquet, if low down.

Leg.—Tourniquet to thigh, or forced flexion at knee. In the case of ruptured varicose veins a pad and bandage applied round the leg and extending above and below the wound will be found sufficient.

Foot.—Direct pressure and elevation; if bleeding be severe, forced flexion at knee, or pressure on posterior tibial artery.

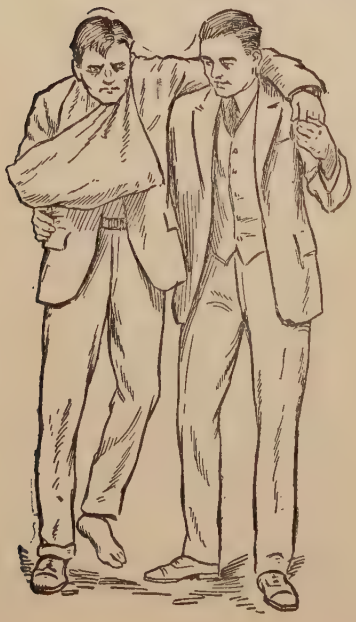
LIGHTNING STROKE

This is a comparatively rare occurrence, but is of such a nature that anyone may find himself face to face with a case. In the severer cases the victim is killed on the spot, being much charred and burned; in the less severe instances, he suffers from shock, and may exhibit burns of varying degree and size on his body. The treatment is on the same lines as in the case of electric shock, except that there is no danger in approaching the patient freely. The same means of restoring animation must be employed, and, if necessary, artificial respiration.

A doctor should always be summoned to see the patient, as there may be damage of a nature not readily recognized.

Prevention.—When out in a thunderstorm people should keep as much as possible in the open, avoiding the dangerous shelter offered by trees, etc. Keep away from any obvious conductor along which a flash of lightning would be likely to pass, having been attracted to it. If in a house, it is a good plan to close the windows and keep well away from the fire.

REMOVING THE INJURED



A knowledge of the manner in which injured persons may best be removed from the spot where they have sustained the injury is of great importance, because careless or unskilful handling or moving may produce much pain and in some cases is liable to aggravate the bodily damage already done.

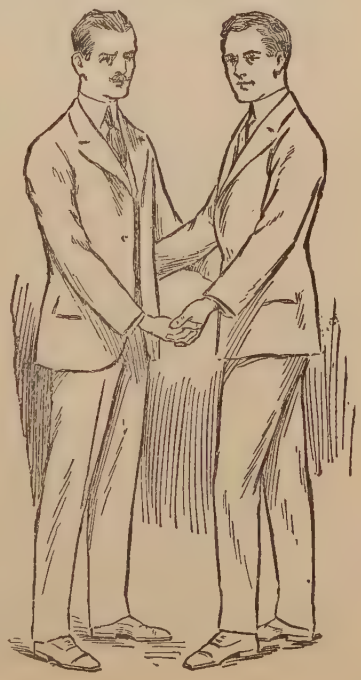
The method of removal depends upon how many persons are available as bearers, and the degree of assistance required by the patient.

By one bearer.—When an arm is injured the patient is usually quite able to walk, and, the arm being suitably supported, the bearer

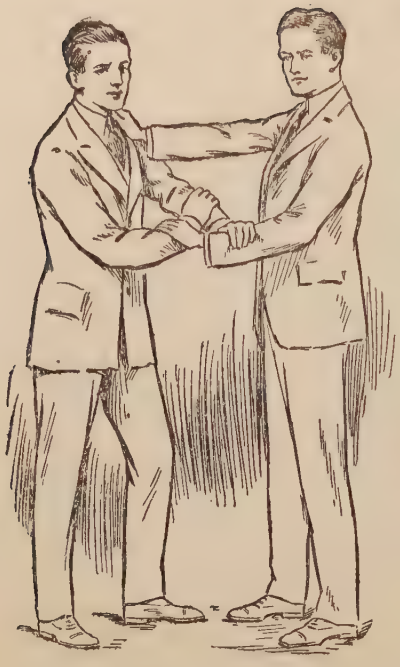
draws the patient's sound arm *over his shoulders* and places his own arm round the patient's waist.

If the bearer be strong and the patient seriously incapacitated, the latter may be carried *in the bearer's arms,* the right one passing beneath the patient's shoulder-blades, the left beneath the upper part of the thighs; in this case the patient should be carried high and supported as much upon the bearer's chest as by his arms. In other cases the patient may be carried *upon the bearer's back,* his arms round the bearer's neck and his legs under the bearer's arms.

In cases of complete unconsciousness, where the dead-weight of the patient's body must be raised and borne by one bearer, the method known as the *fireman's lift* is applicable. The patient is turned on his face, arms by the sides; the bearer stands at the patient's head, and, passing his hands beneath the latter's shoulders, raises him to a kneeling posture. The bearer next slides his hands under the patient's armpits and raises him still further; then stooping and pushing his head between the patient's right arm and his body, he allows the patient's body to fall over his right shoulder upon his back, while the patient's right arm comes round the bearer's neck and is steadied temporarily by his left hand. Finally, the bearer, passing his right arm round one or both thighs of the patient, grasps the patient's right wrist with his right hand, and bringing the weight of the body well on to the center of his own back, rises to the erect position.



By two bearers with hand seats.— If the patient is suffering from such a condition as an injured foot and is able to give some assistance, and if there are two bearers, the bearers divide his weight by means of one of the forms of hand seats, of which the two-handed seat is the most useful. If the patient be more seriously injured, some form of stretcher



must be obtained or improvised as described below.

For the *two-handed seat* the bearers face each other, the one on the right interlocking the fingers of his right hand with those of the left hand of the other bearer; each places his disengaged hand behind the patient or on the other bearer's hip or shoulder. In lifting the patient, they kneel at his sides, each upon the knee nearest to his feet, and, forming the seat beneath his thighs, they rise together supporting him, while he assists, if possible, by putting his arms round their necks.

For the *three-handed seat,* the right-hand bearer grasps his own left forearm. The left-hand bearer places his right hand upon the shoulder of the other, and grasps the right forearm of the other with his left hand, his left forearm at the same time being grasped by the left hand of the other bearer.

For the *four-handed seat,* each bearer grasps his own left wrist with his right hand; each then clasps the disengaged right wrist of the other with his left hand. To carry a patient by the three-handed or four-handed seat the patient must stand up, and the bearers, stooping, form the seat behind him.

If a patient be absolutely helpless and it is urgently necessary to carry him quickly for a short distance only, the *fore-and-aft carry* may be used. One bearer stands at the patient's head and





passes his hands behind the shoulders into the armpits, while the other bearer stands between the patient's legs, facing toward his feet, and takes one leg under each arm.

By help of a stretcher.—If the patient be unable to walk or to sit upright in the conditions above described, a stretcher must be obtained. If no regular canvas stretcher be at hand, a satisfactory one may be improvised from a pair of poles six or seven feet in length and a couple of coats with the sleeves turned outside in. The coats are buttoned over the sleeves, through which the poles are then passed. Or a blanket may be used, two poles, rifles, or similar objects being laid upon it about twenty inches apart, and the ends and sides of the blanket being then successively folded over them. Various other articles, such as a light sofa or a window-shutter, or a blanket supported by four people, one at each corner, may also be used.

The patient, having received suitable first-aid treatment, is lifted on to the stretcher as follows:

When there are four bearers (referred to as Nos. 1, 2, 3, and 4), the first three place themselves on the left side of the patient, and No. 4 on his right; No. 1 is opposite his knees, Nos. 2 and 4 are opposite his hips, and No. 3 is opposite his shoulders. All kneel on the left knee, facing the patient, and take hold of him as follows: No. 1 passes his hands and forearms beneath the patient's legs, the hands wide apart. Nos. 2 and 4 pass their hands and forearms beneath the patient's hips and loins. No. 3 passes his left hand across the patient and under his right shoulder, the right hand beneath the left shoulder of the patient. All then lift the patient off the ground and rest him upon the right knees of Nos. 1, 2, and 3. No. 4 disengages, gets the stretcher, places it directly beneath the patient, and again assists in supporting him as he is lowered gently on to the stretcher. The patient is lifted off the stretcher in precisely the same way.

SUNSTROKE

Sunstroke, heat-stroke, etc., are terms applied to the effects produced upon the central nervous system, and through it upon other organs of the body, by exposure to the sun or to overheated air. Although most frequently observed in tropical regions, this

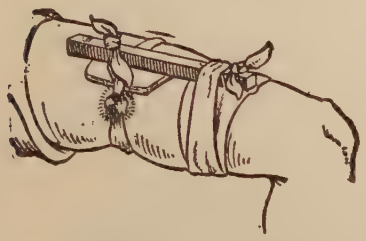
condition occurs also in temperate climates during hot weather. A moist condition of the atmosphere, which interferes with cooling of the overheated body, greatly increases the liability to suffer from this ailment.

Treatment.—Means should be adopted to prevent attacks in the case of those who must necessarily be exposed to the sun. These consist in the wearing of loose clothing, and of a suitable helmet with protection to the neck and back, in due attention to the function of the skin, and in the avoidance of alcoholic and other excesses. Cold water may be drunk in small quantities at frequent intervals. Sleeping in the open air in very hot seasons is recommended. The treatment of a patient suffering from an attack necessarily depends upon the form it has assumed. In all cases he should, if possible, be at once removed into a shaded or cool place. Where the symptoms are mostly those of syncope and there is a tendency to death from heart-failure, rest in the recumbent position, the use of diffusible stimulants, such as aromatic spirits of ammonia, ether, etc., together with friction applied to the extremities, are the means to be adopted. Where, on the other hand, the symptoms are those of apoplexy or of very high fever, by far the most successful results are obtained by the use of cold (by pumping cold water over the head, neck, and back, the cold affusion, rubbing the surface with ice, or enemata of ice-cold water). The effect is a marked lowering of the temperature, while at the same time a stimulus is given to the respiratory function. Should the temperature be lowered in this way but unconsciousness still persist, removal of the hair and blistering a portion of the scalp are recommended. The subsequent treatment will depend upon the nature of the resulting symptoms, but change to a cool climate is often followed by marked benefit, in cases which show chronic effects of the sunstroke.

TOURNIQUET

A tourniquet is an instrument used for the temporary stoppage of the circulation in a limb, so that bleeding may be controlled. There are various forms of tourniquet, the simplest being a *tourniquet improvised* from a band such as that made by a handkerchief folded cravatwise, tied round the limb, and then

twisted up by means of a rigid object passed beneath it as seen in first illustration.



Tourniquet for leg.



Tourniquet for arm.

Two simple forms of tourniquet. The first is an improvised tourniquet, the knot being over the femoral artery, and the lower band being intended simply to keep the handle of the tourniquet from unwinding; the second represents Esmarch's elastic-band tourniquet.

Petit's tourniquet has a linen strap passing over two pairs of brass rollers, which can be separated from one another by a screw, thus tightening the strap after it has been buckled round the limb.

Esmarch's tourniquet, as shown in the second illustration, consists of an elastic band which is wrapped with moderate tightness round the limb, and then prevented from unwrapping by tapes. It is the form generally used.

In applying a tourniquet for bleeding, it must be rendered sufficiently tight to stop the circulation completely. Otherwise, if the veins only be compressed and the arteries still open, the bleeding is made worse. A tourniquet must not be left in position longer than is absolutely necessary, or else gangrene of the limb may result.

UNCONSCIOUSNESS

Unconsciousness is a condition depending usually on some disorder of the brain, and may be of various degrees.

Varieties.—Sleep is a natural form of unconsciousness due to a resting condition of the brain, and when the brain remains irregularly active various peculiar forms of unconsciousness or of disturbed consciousness are apt to ensue, such as delirium, somnambulism, hypnotism, catalepsy, ecstasy. In syncope or fainting, the brain ceases to act for a time in consequence of a bloodless state, brought on by feebleness of the heart's action. In the lesser forms of epilepsy, the epileptic sometimes becomes

unconscious of his surroundings, though able to perform such a simple act as to take off his clothing, or to run some distance, or even to attack another person.

Stupor is the name given to a partial state of unconsciousness from which the person can be roused for a moment by some powerful stimulus such as a pinch or a shout.

Coma means a condition of complete oblivion to external things very near to death.

Causes.—Fainting, as already stated, is due to deficient supply of blood to the brain, and anything which brings this about may cause a faint. Among injuries to the brain, apoplexy, compression, and concussion of the brain and inflammation affecting the brain or its membranes are the chief causes. Epilepsy is also a cause of passing unconsciousness either accompanied by a fit, or, in the slighter forms, without any such seizure. Narcotic poisons, chief among which stands opium, and drugs of the class to which alcohol and chloroform belong, also produce stupor. The poisons that accumulate in the blood during various diseases, such as Bright's disease and diabetes, may produce coma before they lead to death, though in many cases the state of dulled consciousness that precedes death is due simply to gradual waning of the vital powers.

Treatment.—It is of the utmost importance to determine the cause of unconsciousness before proceeding to treat any given case. Fainting brings with it its own cure, and little is necessary beyond leaving the unconscious person recumbent. Unconsciousness due to compression of the brain, resulting from some severe injury to the head, demands careful watching and often requires the energetic treatment of trephining the skull in order to remove blood-clots, ligature torn blood-vessels, etc. The unconsciousness of uremia due to Bright's disease is perhaps the form most liable to be mistaken or overlooked, but doubts as to this are set at rest by examination of the urine.

WOUNDS

A wound is any breach suddenly produced in the tissues of the body by direct violence. An extensive injury of the deeper parts without corresponding injury of the surface is known as a bruise or contusion.

Varieties.—Classified according to the immediate effect produced, four varieties are usually described, viz., *incised, punctured, lacerated,* and *contused.*

Incised wounds are usually inflicted with some sharp instrument, and are clean cuts, in which the tissues are simply divided without any damage to parts around. The bleeding from such a wound is apt to be very free, but it can be readily controlled.

Punctured wounds or stabs are inflicted with a pointed instrument. These wounds are perhaps the most dangerous, partly because their depth involves the danger of wounding vital organs, partly because bleeding from a stab is hard to control, and largely on account of the difficulty of purification. The wound produced by the modern nickel-nosed bullet is a puncture, much less severe than the ugly lacerated wound caused by an expanding bullet or by a ricochet, and if no clothing has been carried in by the bullet, the wound is clean and usually heals at once.

Lacerated wounds are those in which great tearing takes place, such as injuries caused by machinery. The blood-vessels being torn and twisted, little bleeding is apt to result, and a limb may be torn completely away without great loss of blood. Such wounds are, however, specially liable to the danger of suppuration.

Contused wounds are those accompanied by much bruising of surrounding parts, as in the case of a blow from a cudgel or poker. In these wounds also there is little bleeding, but healing is slow on account of damage to the edges of the wound.

Any of these varieties may become infected by pus-forming germs and develop into a *poisoned wound.*

First-aid Treatment.—The first duty of a bystander who renders help to a wounded person is to check any bleeding. This may be done by pressure upon the wound with a clean handkerchief, or, if the bleeding is serious, by putting the finger in the wound and pressing it upon the spot from which the blood is coming.

If a doctor is to see a wound within a few hours, it should not be interfered with further than is necessary to stop the bleeding and to cover the wound with a clean dry handkerchief or piece of lint. In cases where expert assistance is not soon obtainable, one of the following procedures may be adopted. The bleeding

being checked, the next step is to cleanse the wound and surrounding skin.

This may be done:

(*a*) *By painting freely with tincture of iodine* the wound and the surrounding skin, and covering with a piece of clean dry lint; this answers well in the case of small wounds and abrasions.

(*b*) *By washing with clean water* (preferably boiled). For this purpose, one requires two *clean* bowls scalded out quickly with boiling water and filled with *clean* warm water; also several *clean* cloths, which may be handkerchiefs, squares of lint (preferably boracic lint), or newly washed rags.

(1) First, it is essential that the person who is to dress the wound should wash his own hands, and especially the nails, thoroughly with soap and water.

(2) Press a clean cloth upon the wound to prevent the entrance into it of dirty water, and carefully wash the skin around the wound with water from one of the bowls, using soap if necessary.

(3) Wring out a fresh cloth from the clean water in the second bowl, and with it gently dab the wound. Remove, replace by another clean cloth similarly wrung out, and fix with a folded handkerchief.

(4) The injured part is finally fixed so that movement is prevented or minimized. A wounded hand or arm is fixed with a sling, a wounded leg with a splint.

(5) If the injury has caused severe shock, stimulants may be necessary.